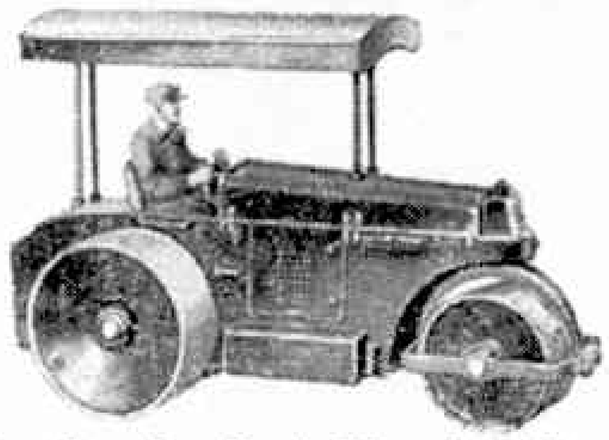
VOL. XXXIII. No. 5 MAY 1948

# MECCANO MAGAZINE

MEN AT WORK

6D.

# DINKY TOYS



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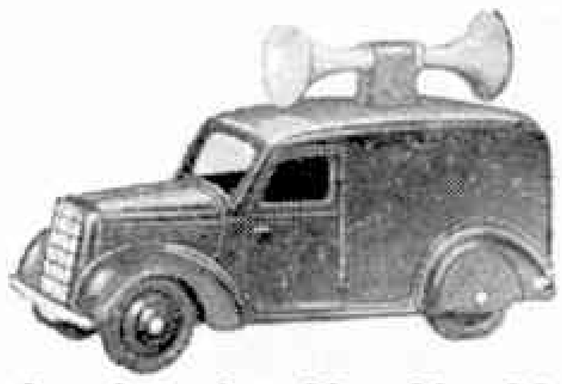

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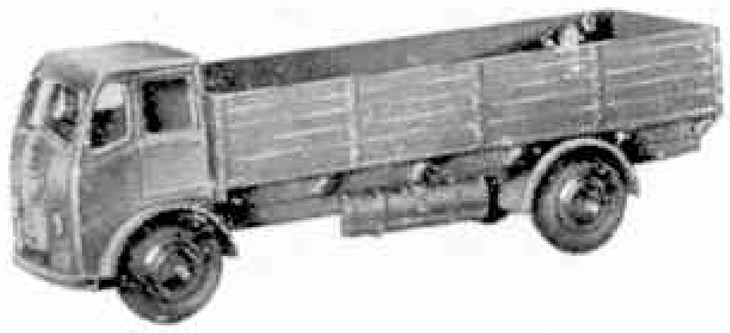

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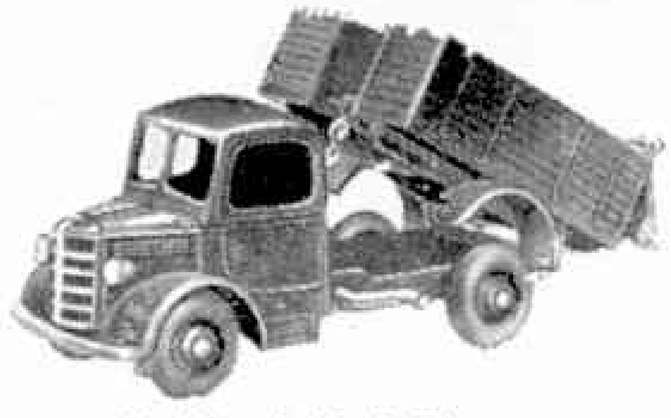

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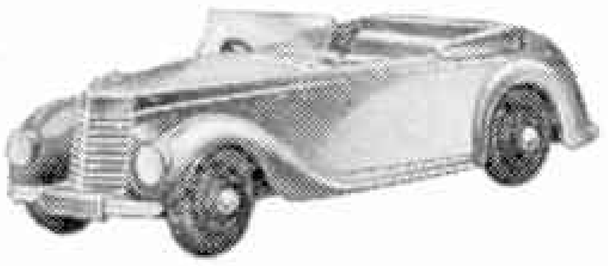

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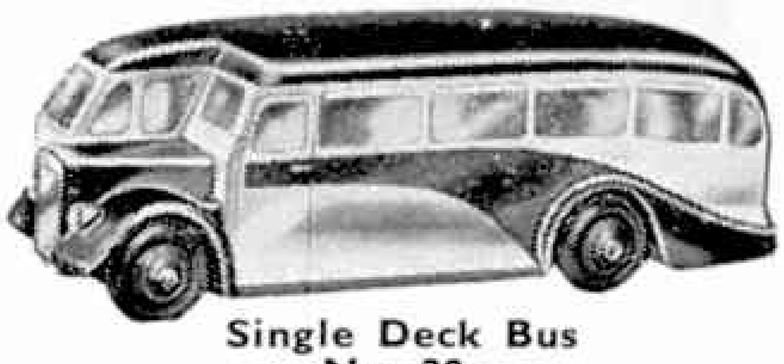

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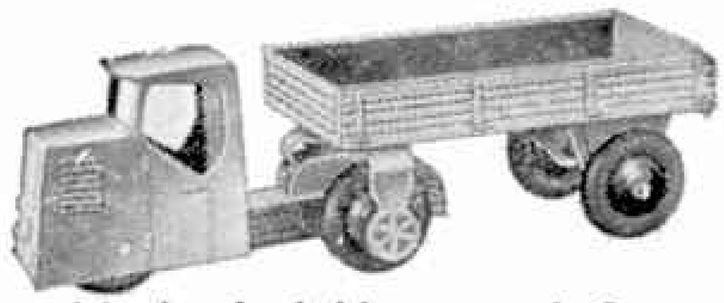

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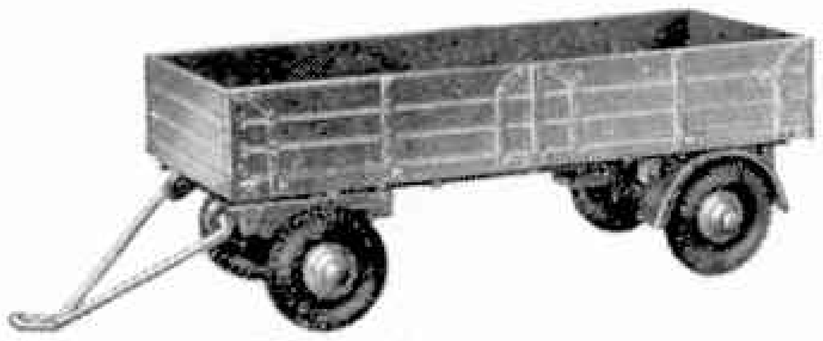

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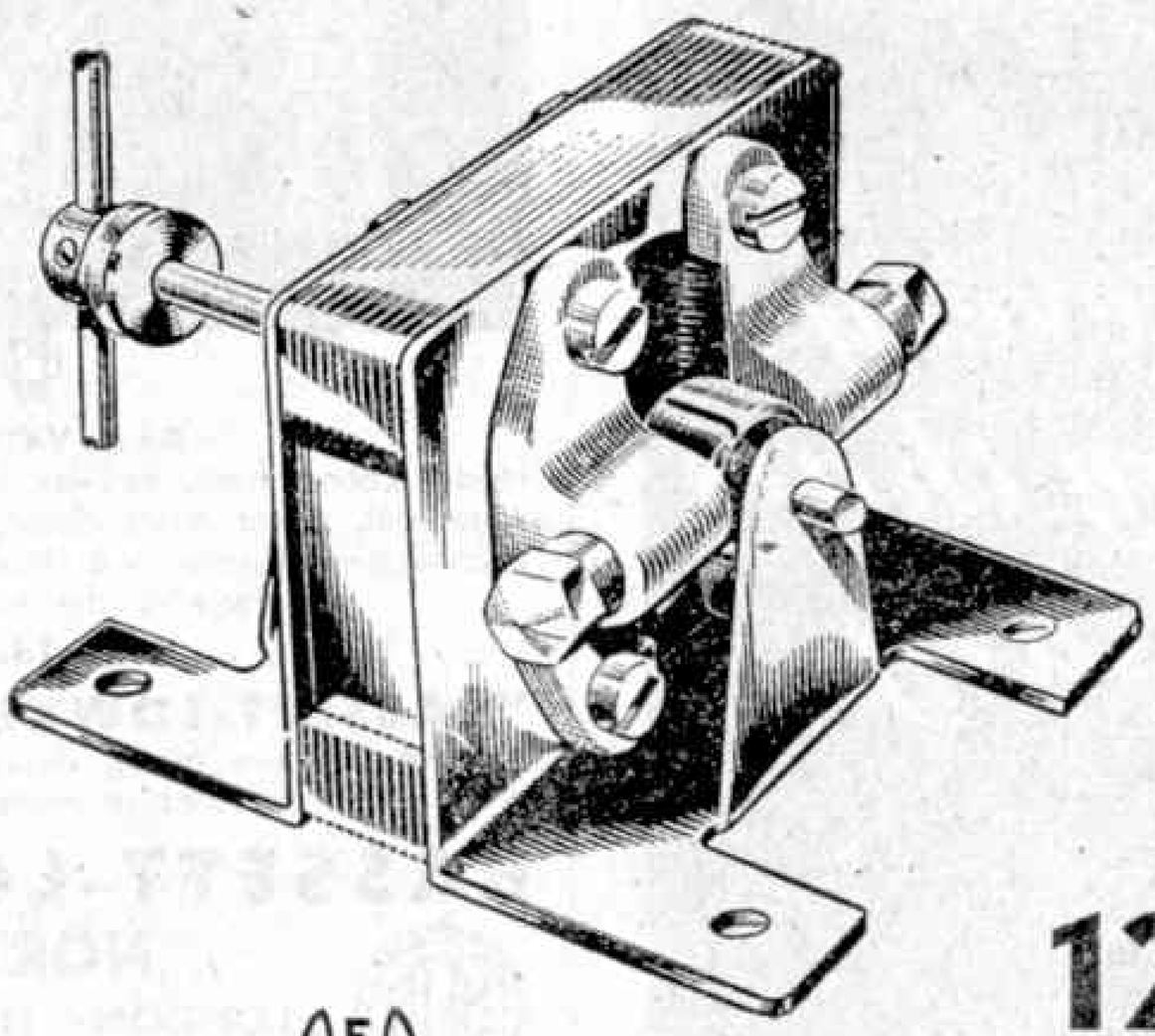

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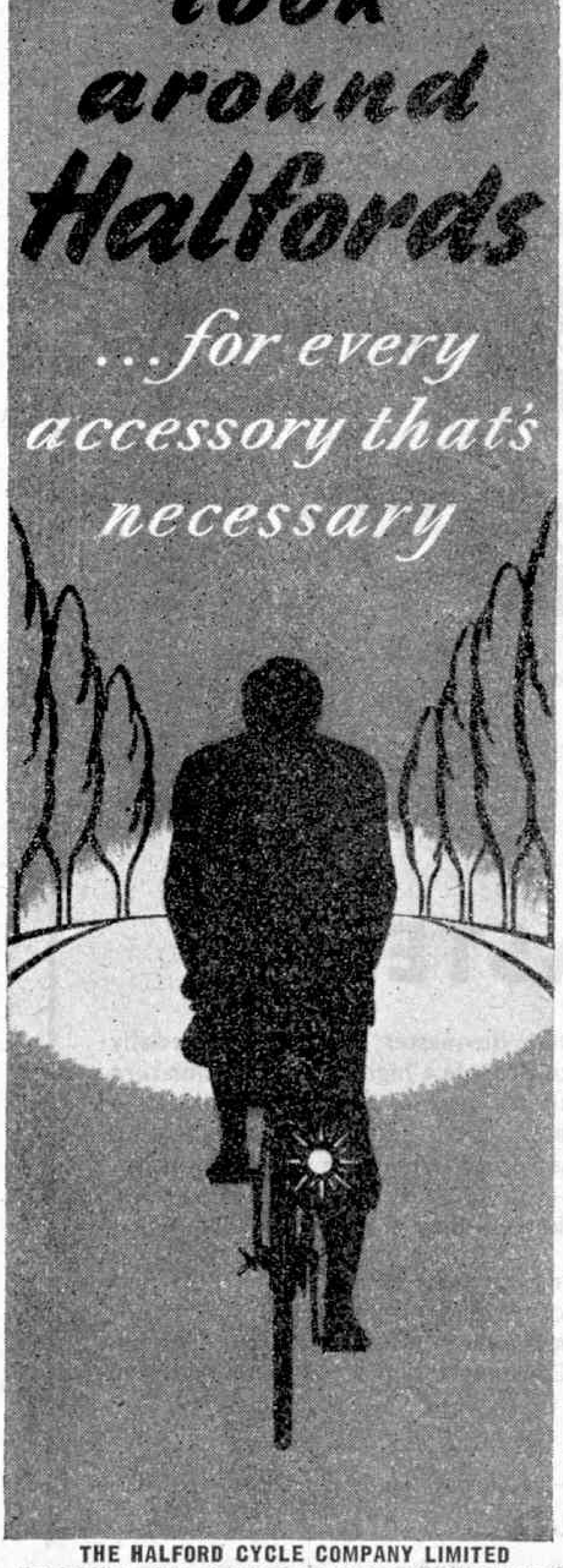

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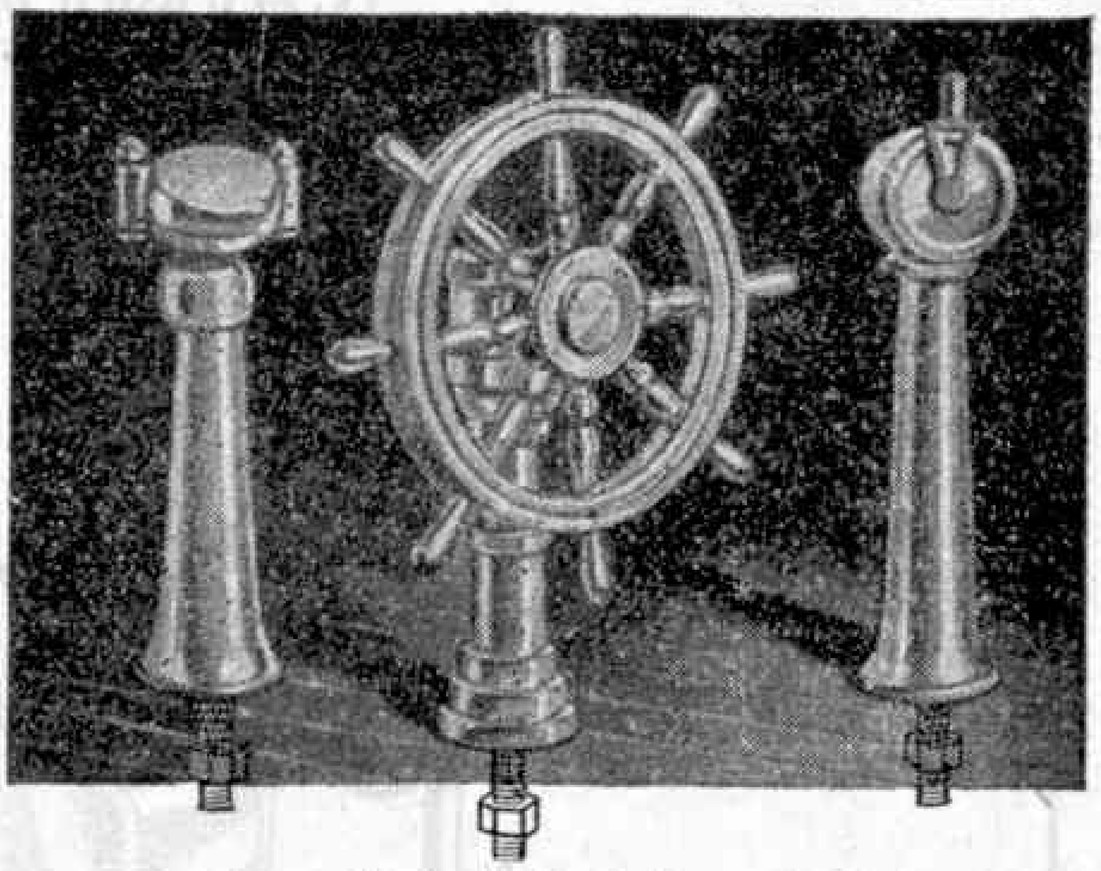

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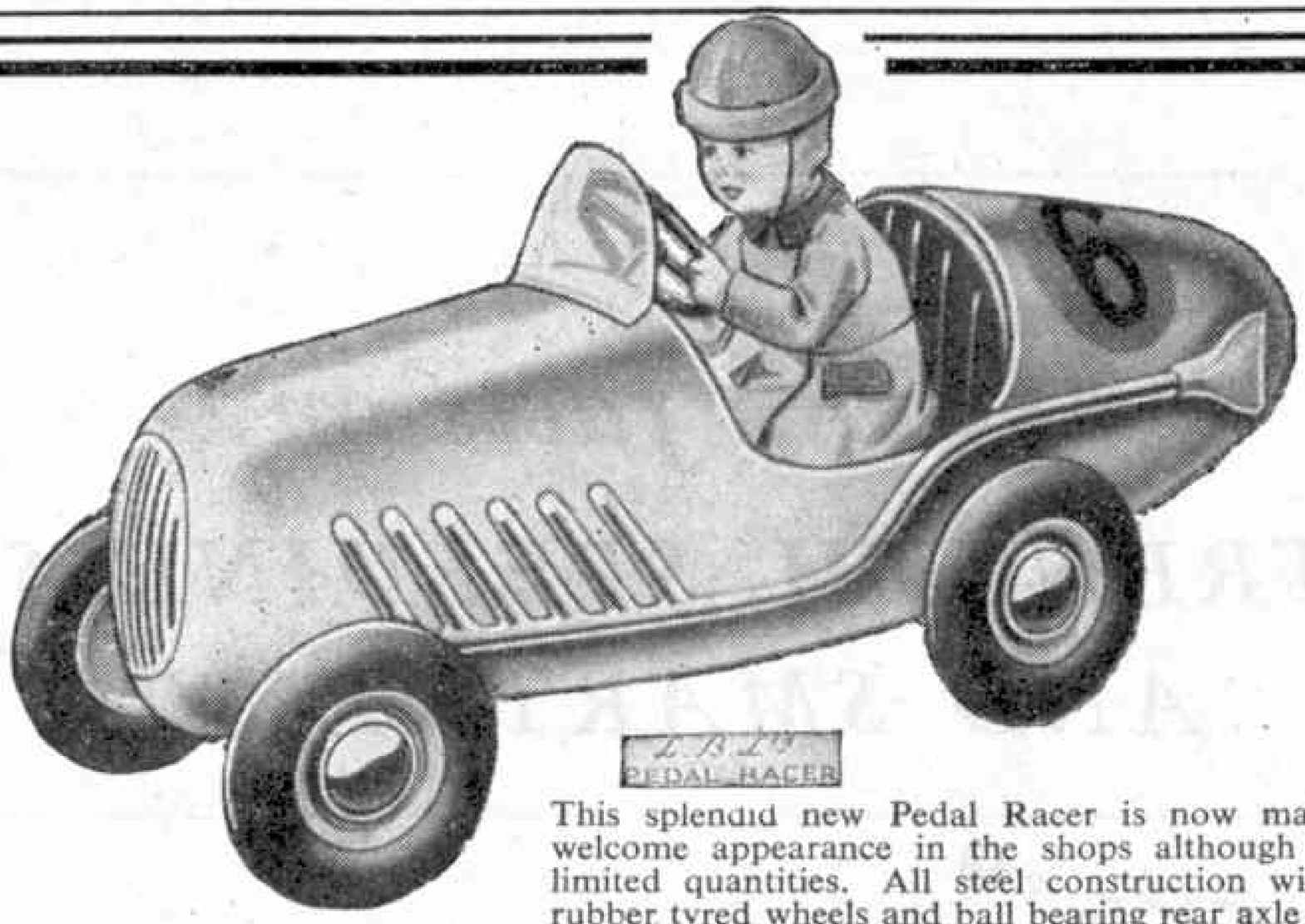


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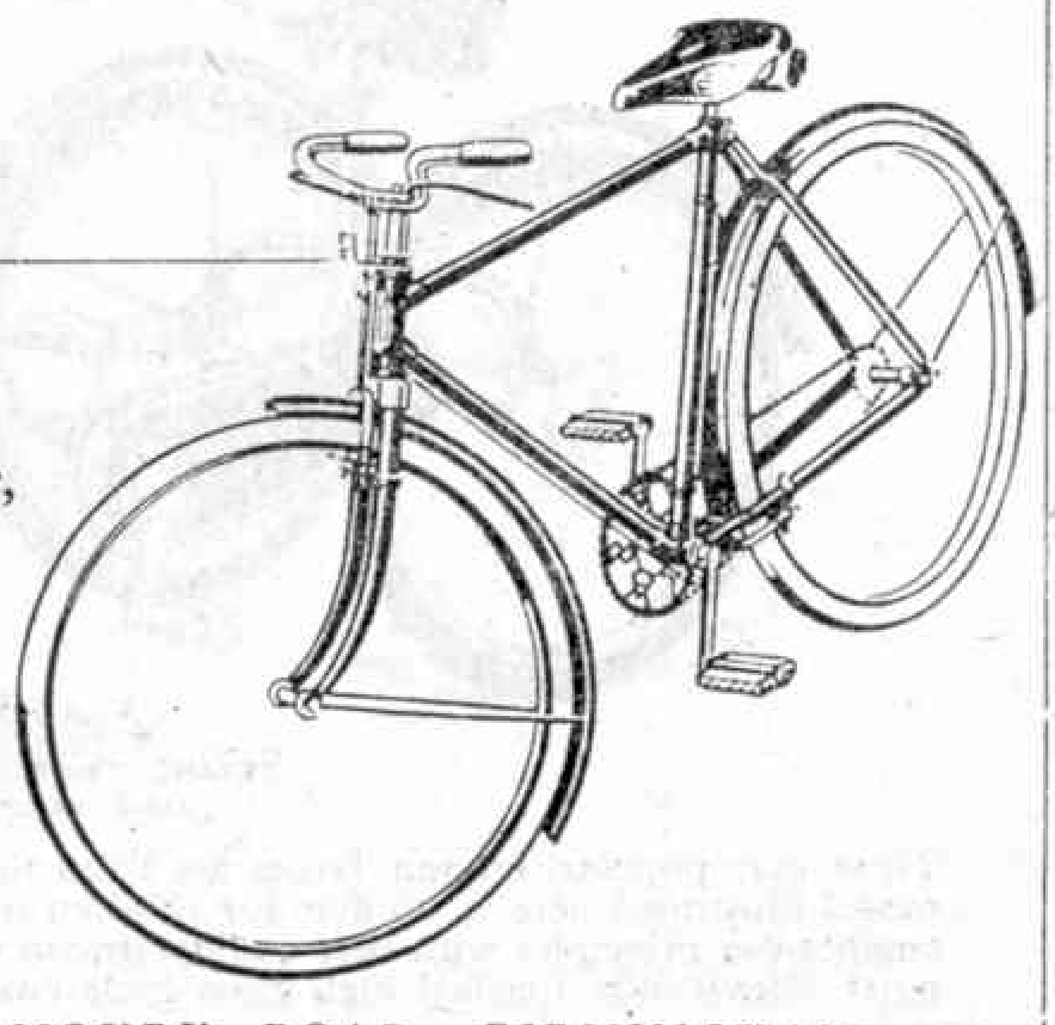

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**Next Month:** "ROCKY MOUNTAINS WONDERLAND"


# MECCANO MAGAZINE

Editorial Office:
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Vol. XXXIII
No. 5
May 1948


## With the Editor

### Locomotives for British Railways

With the fusion of the four main line railway companies into one nationalised system, *"British Railways,"* we have entered an exciting period during which various locomotives, which hitherto have never challenged one another on the same rails, are to be tested and compared. Brief details of the comparative trials already in progress appear in *"Railway Notes"* this month. Drastic decisions will have to be made by the locomotive authorities, regardless of sentiment, in determining future construction policy. For instance, which of the "Pacific" types now running in this country is really the best? Will one type of "Pacific" be suitable for all main lines?

The problem of axle-load limits on certain routes calls for locomotives suitably designed, but otherwise there is no reason why standard engines should not be adopted on *"British Railways."* The process of picking out the best is by no means easy, however. Looking back one can see that mistakes were made after the grouping of 1923. The trials carried out at the time, and the famous "Castle" —"Pacific" contest of 1925, are recalled by these new tests.

The 1948 nationalisation brings an even bigger problem than that of 1923. There are 20,000 locomotives to be sorted out. Fifteen years passed before the former L.M.S. succeeded in reorganising their stock of half that number, and this gives some idea of the size of the present problem.

Before a standard locomotive can be produced for *"British Railways,"* someone will have to decide upon a universal type of brake system, a universal driving position (right-hand or left-hand) and a universal system of head code brackets. At present there are differences between all the main lines in these and other details of design and equipment.

### Our Oil Refining Articles

This month appears the last of our articles on oil refining in Britain. These articles have been prepared for me by the experts of the Manchester Oil Refinery Ltd., and they give a good picture of the British oil refining industry. It is impossible to deal with a subject of this kind without introducing technicalities, which sometimes make rather difficult reading. The petroleum industry is of such enormous importance to Britain, however, that I suggest that any readers who have passed over these articles as "too complicated" should make another effort and read the series through from the beginning. I shall be glad to try to clear up any difficulties that may arise.

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# Helicopters at Work

By John W. R. Taylor

THE most important news about helicopters is that at last they are being put to work. At the moment only the Sikorsky S-51 and Bell 47 are available for commercial service, but they are doing jobs that no other type of aeroplane could do. This makes up somewhat for their high initial cost—£17,000 in the case of the S-51.

**Loading agricultural dust into one of the two 220 lb. capacity hoppers of a Bell 47 crop-dusting helicopter.**

## Down on the Farm

Some jobs are merely stunts, like the lady trapeze artiste who performed her act on a trapeze slung under a Bell 47; but others are very practical. For instance, the Argentine has been suffering increasingly in recent years from swarms of locusts, which caused the loss of more than £6,000,000 to the corn crop alone in 1946. Every method of combating the plague failed until last year, when a Buenos Aires firm obtained 11 Bell 47 crop-dusting helicopters, filled their hoppers with anti-locust dust and flew them straight into the swarms. The results were astonishing, up to 98 per cent. of the pests being killed in some attacks, the first time the locust plague had ever been effectively halted.

In Canada, Airspray Limited of Toronto have used similar aircraft to spread D.D.T. and rotenone dust over crops of potatoes, beans, corn, tomatoes, onions and tobacco. This work proved most effective, for the down-thrust from the rotor beat the dust past the top layer of leaves, reaching those underneath.

Dusting is only one way in which the helicopter can be useful to the farmer. In California the hoppers of Bell 47s have been filled with corn for aerial crop sowing, while a Sikorsky machine belonging to R.A.F. Coastal Command, operating from Thorney Island, trawled a fine net after it with the object of collecting samples of insects blown across to this country from the Continent. British agricultural experts were particularly anxious to discover if the Bean Aphis arrives in this way.

Another "farm" use has its drawbacks, for it is doubtful if the "cowboy" films of the future will be as exciting if, as is suggested, the cowboys sell their horses and roam the range by helicopter to count cattle, locate strays or to get from their ranch to town quickly in rough country.

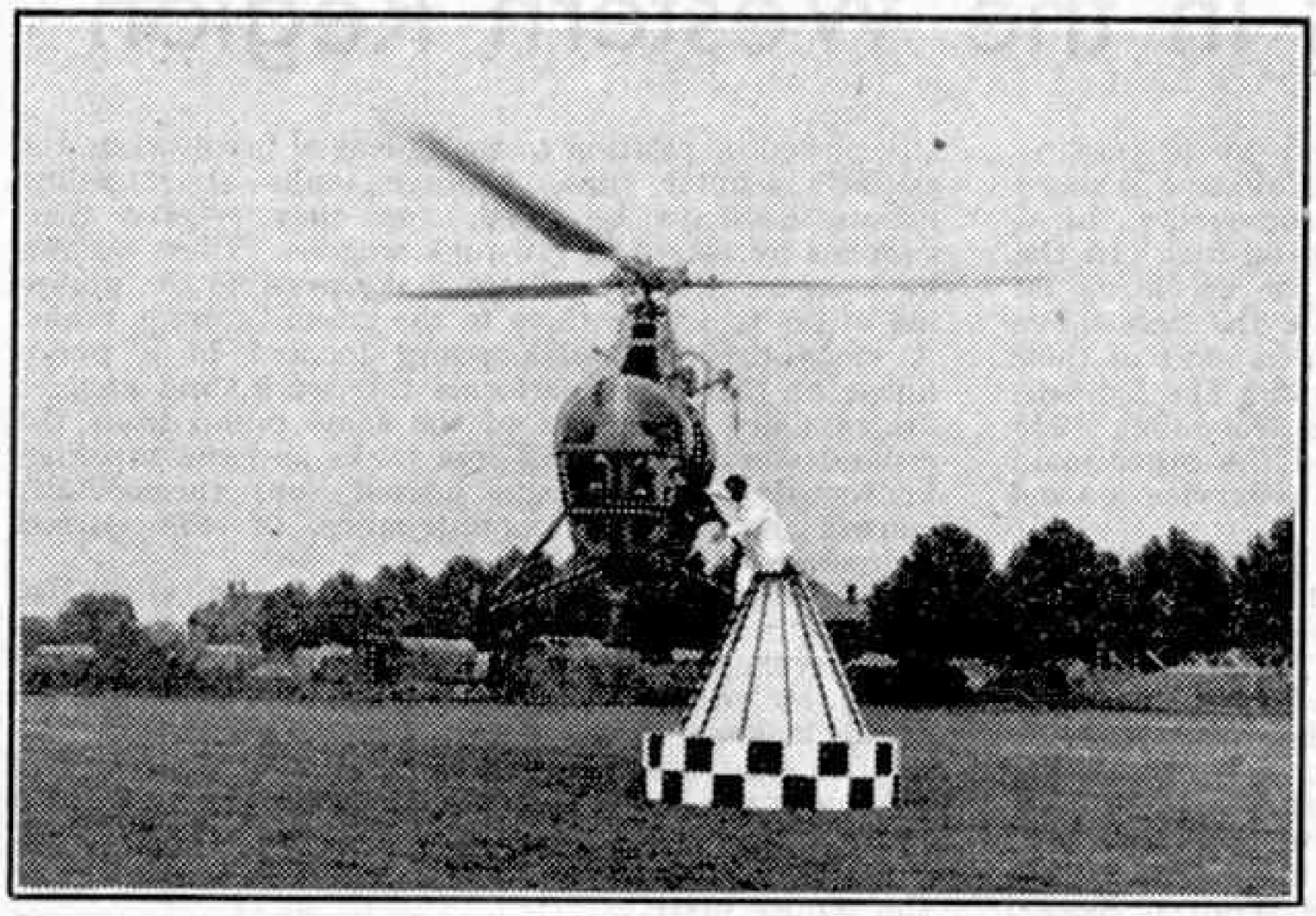
## Man-hunts, Real and Make-believe

Talking of films, R.K.O. Studios in Hollywood recently shot a series of chase

**The helicopter in action. It can cover a 60 ft. swath in one pass, and dust between 100 and 200 acres an hour. The photographs on this page are reproduced by courtesy of Bell Aircraft Corporation, U.S.A.**

sequences from the air, pursuing fleeing bandits with a camera mounted in a Bell 47. Ten hours of flying produced 12 complete sequences for "*Your Red Wagon*," resulting in a saving of £2,500 in production time and equipment.

In a sterner role, the helicopter has proved itself useful for real police duty both in Britain and America. An S-51 was used last year by the Norfolk County police during the hunt for the escaped Polish criminal Stanislaw Zborowski, near Thetford. In Connecticut, U.S.A., another S-51 was used to control traffic swarming to and from the annual Yale-Columbia-Pennsylvania boat races. Working in conjunction with 30 patrol cars, the aerial "cop" in his 'copter was able to sort out traffic jams quickly, and even call up a breakdown lorry to an accident.



**Sikorsky S-51 helicopter showing how it could be used to lower an engineer on to a buoy at sea, for maintenance work. The S-51, with a "Leonides" engine, is being built in this country by Westland Aircraft Ltd., to whom we are indebted for this photograph.**

Another helicopter joined an expedition sent out by the Lundberg-Ryan Air Exploration Company to survey and open up new mineral and oilfields in Northern Canada. Hans Lundberg hopes to prove to the Canadian Government that geographical survey by helicopter can accomplish in 10 years what it would take 100 years to do by the ordinary methods.

An obvious job for the helicopter is to deliver mail quickly between post offices or from post office to airfield. Experiments carried out in America in 1946–7 proved an unqualified success, and plans are in hand for large-scale use of helicopters by the American Post Office. Similar tests in Britain were delayed by lack of suitable equipment, but flights are now being made by an experimental B.E.A. Helicopter Unit carrying mails in the Bristol-Yeovil-Poole area. Later the tests will be extended to other parts of the country, and may well lead within a few years to a regular helicopter mail service in this country.

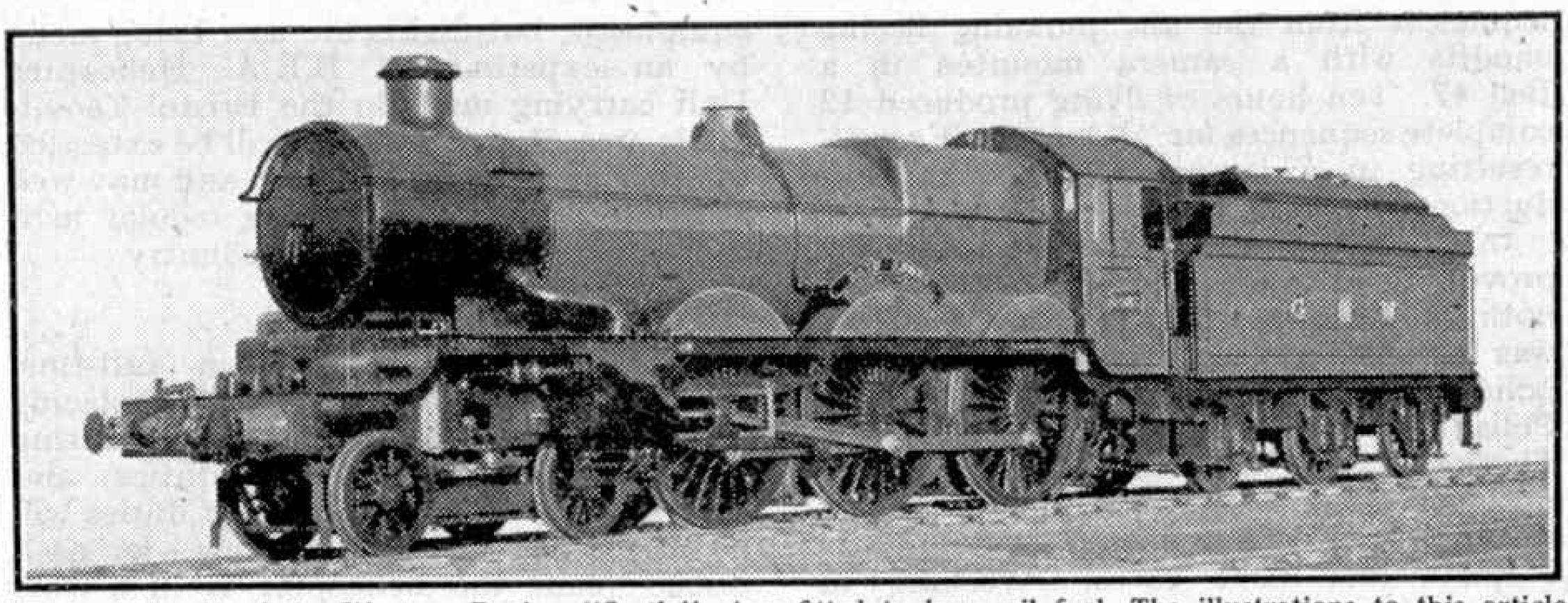
### Helicopters to the Rescue

Helicopters are already in full-time service with the American Fleet, replacing destroyers for such tasks as delivering mail, for communications duties and spotting. But one of their chief duties will be to rescue "ditched" aircrew—for as a rescue 'plane the helicopter is in a class by itself, ashore or afloat. They have already proved their worth at sea, both in the Pacific and Mediterranean, where several Naval pilots have been snatched from the sea after forced landings.

Ashore, dozens of people have been rescued by helicopters from regions as far apart as the Arctic Circle and the tropical jungle of Brazil. When a forest fire swept over the rugged mountains near Los Angeles, two helicopters rescued 20 trapped fire-fighters, transported 250 more to fire fronts with no road access, and delivered a ton of supplies each day to them.

The most famous helicopter rescue occurred in September 1946, after a "Skymaster" had crashed in thick fog, 25 miles from Gander Airport, Newfoundland. Twenty-five miles is six minutes flying time, not far, but in this case 25 miles of thick spruce forest and bog. It was obviously impossible to carry the 18 survivors to safety through the forest; the only hope was by helicopter. It was not a forlorn hope; 24 hours after two Sikorsky aircraft reached Gander all the injured were safe in bed.

The story sounds simple written like that. But it does not tell of how the first helicopter to reach the scene of the accident sank up to its fuselage in the ooze and was only saved by the prompt action of its pilot, who put the rotors into climbing pitch and hovered above the ground while timber for a landing stage was flown out from (*Continued on page 176*)



"Bath Abbey," of the Western Region "Castle" class fitted to burn oil fuel. The illustrations to this article are by courtesy of the Western Region.

# Oil Burners in the Western Region

OUR cover this month, reproduced by permission of the Editor of the "*British Railways Western Region Magazine*," shows the conversion of a Western Region engine from coal to oil-fuel. In the recent renewal of experiments in the oil firing of steam locomotives the G.W.R. made the first move a year or two ago by the conversion of some of their big 2–8–0 mineral engines. Now, under the Government programme referred to in the November 1945 "*M.M.*," work is proceeding also on the other main lines, with the object of putting into service a total of 1,217 oil-burning engines.

In this conversion scheme the London Midland, Eastern, North Eastern and Southern Regions are concentrating on fitting up heavy freight engines, with some mixed-traffic types. But the Western and Southern Regions intend to deal with express types as well, and No. 5079 "*Lysander*" shown in the cover illustration is one of 25 "Castles" included in Swindon plans. In addition 84 of the useful "Hall" class are being dealt with, and the first of these was No. 5955 "*Garth Hall*," illustrated in the "*M.M.*" in August 1946. So there will be 109 Western Region oil-burning 4–6–0s when the programme is completed; and the 18 big 2–8–0s included in the earlier scheme will have been increased to 63.

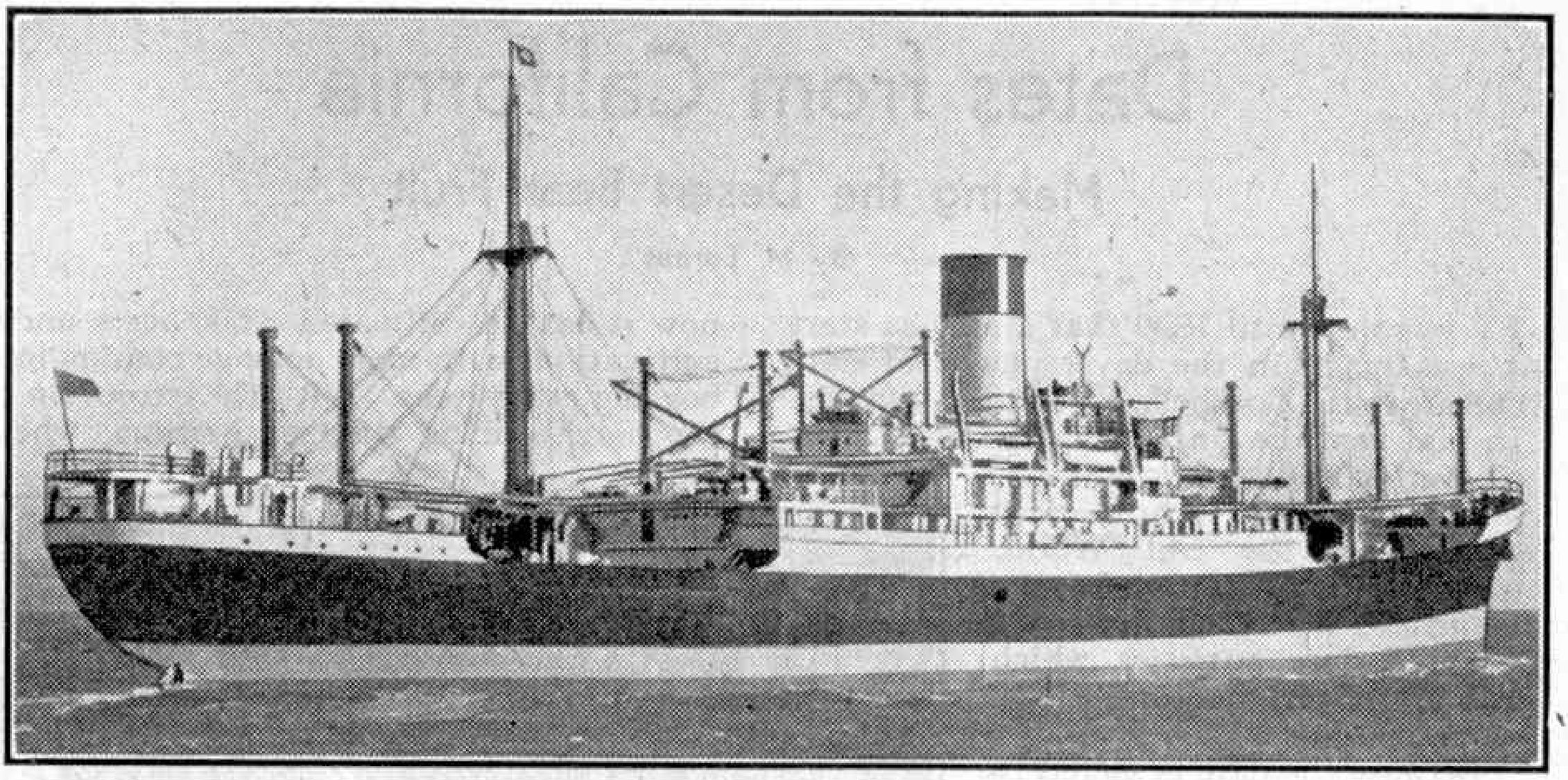
Piping of the oil from the tender fuel tank to the burner in the fire-box means additional connections between the engine and the tender. The ends of these can be seen peeping out of the upper slotted opening below the cab floor of "*Lysander*." The larger one in the centre carries steam to the heater provided in the tender to keep the fuel oil in the correct condition for easy flowing by gravity from the tender to the fire-box. The group of little hand wheels near the man working on the left side of the cab control the steam supply for burner cleaning purposes, for the tender heater and for the auxiliary blower, and also the burner steam that atomises the oil. The fuel regulator and other fittings are close by, for the Western Region fireman rides on the left-hand side of the cab.

The fuelling arrangements at depots have to be fairly elaborate, and the depots have to be strategically placed in relation to the mileages involved in the engine's regular runs. Storage tanks at refuelling depots have to be filled, and they receive their supplies by means of rail tank wagons. These wagons have steam heating coils to make possible the pumping of the fuel from them to the ground storage tanks. A steam-driven duplex pump located in a pump house at the depot performs this work, and engines are refuelled by means of the same pump from the ground storage tanks. These tanks and the pipelines in the depot are steam heated, and thermostatic control ensures the maintenance of the correct temperature.

The lower illustration shows the typical 26,000 gallon storage and refuelling plant at Swindon. This has overhead arrangements for filling the tender tanks by means of special standpipes designed to avoid leakage or overfilling. A neat detail is the electric light fitted by the fuel outlet; it is controlled automatically by the movement of the standpipe arm. The earlier depot and tender arrangements provide for the connection of the fuelling pipe below the tender body.

The largest locomotive oil storage and refuelling plant in this country is at Old Oak Common, Western Region. This has a capacity of 352,000 gallons. A Western Region tender tank holds 1,700 gallons, or sufficient for about 250 miles of main line running.

The refuelling plant for oil-burning locomotives at Swindon, showing one of the overhead filling standpipes in use.



# A New Blue Funnel Liner

By Denis Rebbeck, M.A., M.Sc., B.Litt., A.M.I.C.E.

THE single screw cargo motorship *"Calchas,"* of 8,298 tons gross, illustrated above, has dimensions about 487 ft. overall and 450 ft. between perpendiculars, by 62 ft. beam by 35 ft. depth moulded, and was recently built and engined by Harland and Wolff Ltd., at the Queen's Island, Belfast, for Alfred Holt and Company of Liverpool. This fine looking cargo liner has four large main cargo holds, two forward and two aft of the machinery space, while No. 3 hold immediately forward of the engine room is arranged in the form of four deep tanks. Two similar deep tanks are arranged at the forward end of No. 4 hold immediately abaft the machinery space.

This notable addition to Britain's fleet of cargo liners is of high-class type with two masts and a single funnel. She has an upper deck, a main deck, forward and aft of the machinery spaces, and an orlop deck in No. 1 hold. There are also poop, forecastle, centrecastle, promenade and boat decks.

Accommodation for twelve passengers is arranged in a deckhouse on the promenade deck, and a dining room and lounge are provided. For officers and European crew the accommodation is in houses on the centrecastle deck, promenade and boat decks; while that for the native crew is arranged aft. Lifesaving appliances include four 26 ft. lifeboats fitted under mechanical davits.

Cargo handling is carried out by derricks and electric winches, and an electric windlass and electric hydraulic steering gear are fitted.

The propelling machinery consists of an eight cylinder double-acting two-cycle Harland-B. and W. engine of the builders' latest type, having exhaust pistons of the same diameter as the main working pistons. The diameter of the main and the exhaust cylinders is 550 mm., the stroke of the main pistons is 1,200 mm., and the stroke of the exhaust pistons 400 mm. The exhaust pistons are driven by eccentrics from the crankshaft.

Compressed air for starting and manœuvring is stored in a cylindrical reservoir charged by motor-driven compressors. The engine room pumps are, in general, electrically driven. The exhaust from the main engine is passed through a waste-heat boiler, which can be alternatively oil fired to supply steam when the main engine is not running.

Centrifugal purifiers for the fuel and lubricating oils, filters, evaporator and the usual accessories are installed, and a well-equipped workshop is arranged in a convenient position in the engine room.

The electrical generating plant comprises four oil-driven generators, each of 220 kW., and one emergency set, also diesel-driven, of 40 kW. There are approximately 85 motors ranging from $\frac{1}{2}$ to 100 h.p. and 900 lighting points.

# Dates from California

## Making the Desert Bear Fruit

By M. Lorant

IT was not until 1890 that a serious start was made in the development of date culture in the Coachella Valley of California. In that year the United States Department of Agriculture sent plant explorers to the far-off date gardens of the Old World, where they inspected the famous Babylonian and Arabian date varieties which had been developed over many centuries.

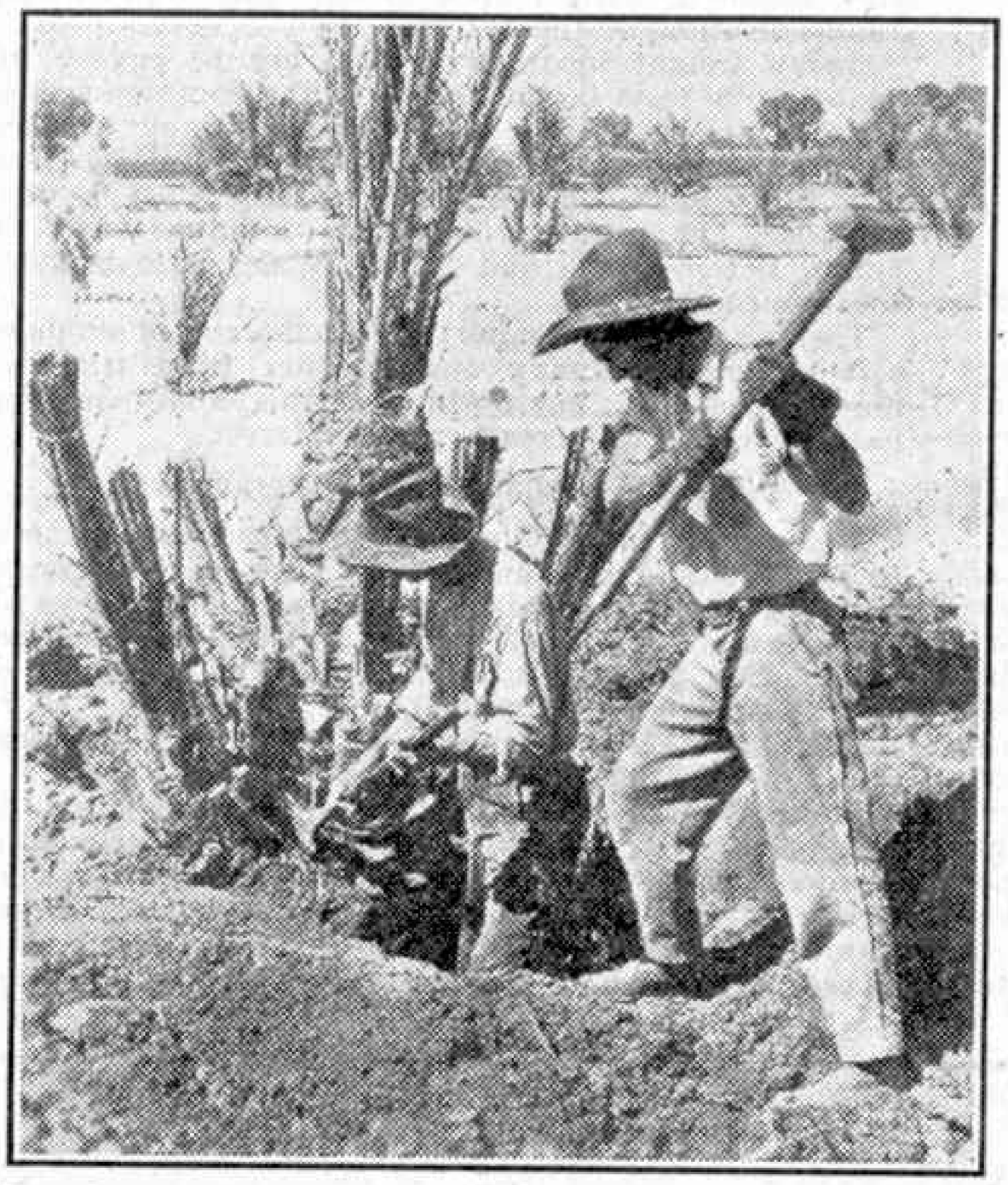
Because the date is sacred to all Mohammedans, and perhaps because they sensed a new competitor in the making, the Arabs were not too anxious to co-operate; they preferred the honour of raising these renowned date palms themselves. Offshoots from only the finest varieties were obtained and shipped back to California, however, though some of these had to be taken out in the dead of night, and one plant explorer actually left a civil war raging in his wake!

**A mature date garden, with the palms in fruit, in the heart of the Coachella Valley, California. The site was formerly a desert.**

From this humble beginning, the great California date industry has grown until now it has an estimated 3,500 acres under cultivation, with more acreage coming into bearing every year. With the exception of the neighbouring state of Arizona, where there is a small acreage, California is the only date producing area in the United States.

**Picking ripe dates from platforms. This is the common method of harvesting when the palms are young and fruit is still fairly near the ground.**

The cost of bringing a date garden into production is high, for it requires about six years and costs from about £500 to £750 to carry one acre of date palms to the point where they begin to earn some money for the owner. The trees are of two kinds. One of these never bears any fruit, but its flowers normally produce enough pollen to pollinate the blooms on 49 fruit bearing palms. Both kinds have to be planted in order to ensure the development of fruit. Nature, by some curious twist, has provided no adequate means for transferring the pollen from the pollen blossom to the fruit bloom. Notwithstanding the fact that the date palm is the oldest known cultivated fruit tree in the world, history teaches us that it has been pollinated by man's hand for thousands of years to obtain full



**New date palms come from offshoots, and here one is being removed for separate planting.**

clusters of perfect fruit.

The normal planting is approximately 50 palms to the acre, of which one is a pollen palm. The other trees produce from 10 to 20 clusters of fruit each, and these hang down like gorgeous festoons between the palm leaves after being pollinated. These clusters are hand-thinned, so that each one weighs about 20 lb., and each tree produces from 200 to 350 lb. of fruit, depending largely on the variety and on the care it receives.

Dates require heavy irrigation. Water pumped from deep wells is used for irrigating the palms in Coachella Valley, as there has been found to be a large supply of exceptionally pure water under the floor of this great Californian valley. An average of 10 to 14 acre-feet, in other words enough water to cover one acre to a depth of 10 to 14 ft., is applied each year.

It is a matter of common knowledge to date growers that date palms grown from seed are not true to type, nor can the plants be budded or grafted like other fruit trees. The only known method of propagating any specific variety is by means of the suckers or offshoots that develop around the lower base of the palm tree, as these are always true to the parent. When these offshoots have developed roots of their own, which they do within two to three years, they are carefully removed from the parent tree by means of wide, specially designed chisels. A robust palm produces 10 to 20 offshoots before losing the capacity to do this at the age of 8 to 12 years. It then settles down exclusively to bearing large quantities of fruit for the rest of its life.

When the dates are first received at the packing house they are in field boxes containing 12 to 20 lb. each. Before they can enter the packing rooms they are placed for at least six hours in a fumigating chamber, exposed to a volatile gas, in order to remove any possibility of bringing insects of any kind into the plant. All traces of the gas are gone within an hour from the time the dates are removed from the fumigator.

After being weighed, the dates are put through various cleaning operations in which they are made to fairly shine. They then pass on a moving endless belt over the grading table, where experienced girls select the various grades. This selection is dependent on size as well as texture and moisture content, so that each date may be packed only in that type of package for which it is best suited. Finally every case is individually inspected for quality.

**Grading dates. Trained graders select the fruit and sort it according to size, quality, texture and moisture content before it is packed.**

# Railway Notes

By R. A. H. Weight

### Locomotive Renumbering Scheme

The method of indicating previous ownership of British locomotives by means of letters prefixed to the numbers applied only to those leaving works during the first 2½ months of 1948, as during March of this year it was decided to introduce a national renumbering scheme. This was to be effective forthwith as engines went into shops for repairs or painting, though not on the former G.W.R. where present numbers are retained on account of the difficulty of altering metal plates. All steam locomotives are gradually to have their numbers indicated upon cast iron plates affixed to the smoke-box door in L.M.S. fashion. Numbers below 10,000 are allocated to the Western Region. Those between 10,000 and 19,999 will be for existing or future diesel, petrol or gas turbine locomotives in all regions, arranged in groups; similarly the 20,000–29,999 section covers electric engines, in which the Southern "CC1" type will commence at 20,000 and the Eastern Region Bo, Bo type at 26,000.

Southern locomotives are having 30,000 added to their existing numbers, but the "Q1," light 4–6–2, and "Merchant Navy" classes will be renumbered in the 33xxx, 34xxx, and 35xxx groups respectively, without the numbers and letters indicating wheel arrangement now used. Isle of Wight engine numbers will not be altered.

Former L.M.S. locomotives have 40,000 added, though a number of old ones now numbered above 20,000 will be renumbered from 58,000 onward. Former L.N.E.R. engines add 60,000 with a renumbering of 4–6–4 No. 10000, probably to 60700. Future standard types are to be numbered 70,000 upward, thus avoiding any possibility of duplication of the same number. The numbers above 30,000 apply to steam engines. New locomotives constructed in 1948–9 will be placed in the number group appropriate to the Region in which they were designed. Usually it will be quite easy to recognise most engines whose numbers are the same with an extra digit added in front. Where space permits, we shall publish details of renumbered locomotives as announced from time to time.

### Locomotive Exchange Trials

During May and June lineside observers will have opportunities of seeing unusual express and mixed traffic engines working over certain trunk routes with dynamometer cars attached to the front of ordinary fast trains running between Euston-Carlisle, King's Cross-Leeds, Waterloo-Exeter, Paddington-Plymouth, London-Manchester, and Perth-Inverness.

L.M.S. "Duchess," "Royal Scot" and class "5," L.N.E.R. "A4" and "B1," S.R. heavy and light "Pacifics" and G.W.R. "King" and "Hall" engines will take part in turn on various long distance passenger train workings. This will be done in order to provide information which will enable locomotive engineers of British Railways to decide on the most satisfactory features of the various types for the work required, with a view to effecting considerable standardisation in the future.

Heavy freight locomotives also are to engage in comparative tests in the course of the comprehensive trials, which may last well into the summer. The types chosen are L.N.E. "01" (rebuild), L.M.S. class "8," G.W. 38xx, and W.D. "Austerity" 2–8–0s and 2–10–0s. The routes will include London yards to Toton, Peterborough and South Wales, also Bristol-Southampton.

There have been important exchanges of engines between one company and another from time to time in the past, but nothing of this comprehensive nature, which will create much interest.

### London Midland Stock Alterations

New 4–6–0 class "5" engines M4748–9 are allocated to 9A, Longsight, Manchester. They have Caprotti valve gear, roller bearings, altered framing and front end. No. 4767 with outside Stephenson link motion and roller bearings was the last built as an L.M.S. engine. No. 3007 of 2–6–0 class "4" is shedded at 12D, Workington; 0–6–0 diesel-electric shunter No. 7130 at 21A, Saltley.

Crewe Works have in hand the construction of more class "5" 4–6–0s, which include experimental features, also class "2" light 2–6–0s and 2–6–2Ts. Derby is continuing to build 2–6–4Ts and diesel shunters, while Horwich will turn out more 47xx mixed traffic 4–6–0s as well as continuing to build the "4F" 2–6–0 design from 3020 on. 4–6–2 No. 6257 has been completed.

We are able to illustrate diesel-electric main line locomotive No. 10000 hauling a down express from St. Pancras to Derby with which smart work has been performed.

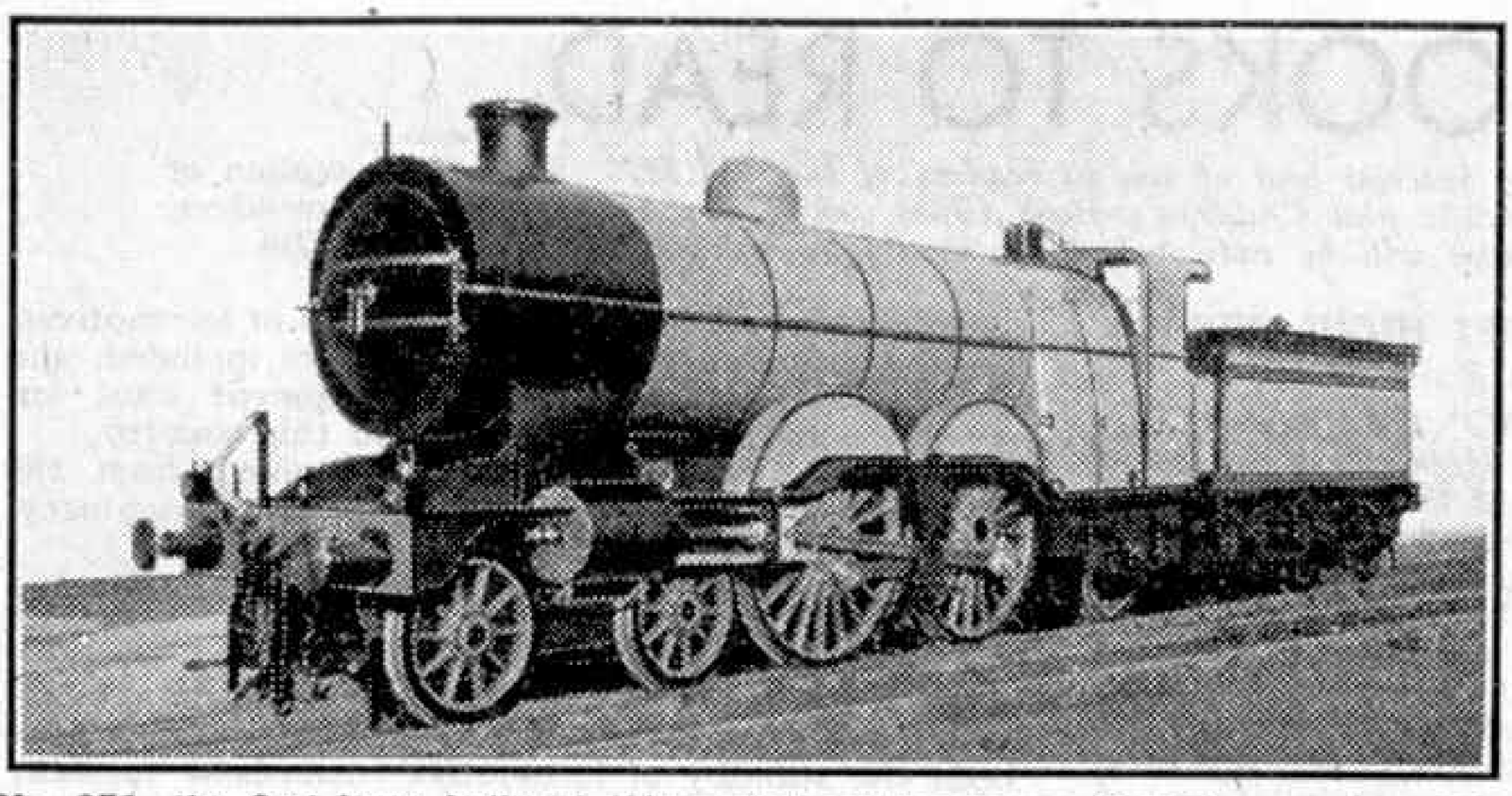
**Britain's first diesel-electric express locomotive at work on the London Midland main line near Elstree. The train is the 2.15 Manchester express. Photograph by E. R. Wethersett.**

### Eastern and North Eastern Regions

"*Mallard*," the famous streamlined "Pacific," now carries chromium plated plaques on the boiler side sheeting commemorating her world-record attainment of 126 m.p.h. during a test run on 2nd July 1938. The name of the similar engine No. 34 has been changed from "*Peregrine*" to "*Lord Faringdon*," as the G.C. 4–6–0 previously bearing the latter name has been scrapped.

New "L1" 2–6–4Ts of the 9000 series are being turned out from Darlington, then after a running-in period are so far being dispatched south for duties based on Stratford or Neasden sheds near London. They are green with electric lighting equipment.

At the time of writing the latest "A2" 4–6–2s built at Doncaster are numbered and named as follows:



**No. 251, the first large-boilered "Atlantic" of the former G.N.R. as restored to its original condition for preservation in York Railway Museum. British Railways official photograph.**

No. E529, "*Pearl Diver*"; No. E530, "*Sayajirao*"; No. E531, "*Bahram*"; No. 60532 "*Blue Peter.*" The first two are stationed at Haymarket and King's Cross respectively. With new number 60066, "*Merry Hampton*" of class "A3" has returned to the Scottish area from Doncaster Works after repair following the Goswick derailment. New numbering and repainting is proceeding apace as overhauls are completed; this applies to all appropriate regions, though no national colour schemes have been decided.

Several classes comprising former Great Central locomotives have recently become extinct, including "B3" (apart from the one rebuilt like "B1"), "B6," "B18," "C5" (compound) and "D6."

### Preservation of the First Large G.N. "Atlantic"

The pioneer large-boilered Ivatt "Atlantic" which led the way to the construction of 93 remarkably powerful and efficient 4–4–2 locomotives that created a new epoch in Britain and rendered magnificent service on the East Coast Route and elsewhere for 35 years or more, was to have been scrapped, but has now been carefully restored to her original condition and repainted as G.N.R. No. 251 which was her original number in 1902. This is to be preserved in York Museum. We are pleased to be able to reproduce a photograph depicting this notable engine as restored. Until accommodation has been arranged in the Railway Museum No. 251 is housed at Doncaster Works.

### Western and Southern Tidings

Additional modified "Hall" 4–6–0s placed in service during March were No. 6981 "*Marbury Hall*," No. 6983 "*Otterington Hall*," No. 6984 "*Owsden Hall*" and No. 6985 "*Parwick Hall.*" The first two are stationed at Bristol (SPM), and Paddington respectively. The name of No. 7001 has been changed from "*Denbigh Castle*" to "*Sir James Milne*" in honour of the General Manager of the former G.W.R., who has just retired. No. 1009 is named "*County of Carmarthen.*"

Construction has commenced at Brighton of the further 4–6–2 "Battle of Britain" locomotives for which names have been allotted. Nos. 21C 150, 157 and 159 are named "*Royal Observer Corps*," "*Biggin Hill*" and "*Sir Archibald Sinclair*" in that order. 21C 148 is "*Westward Ho!*"

One of the most interesting and difficult pieces of track relaying and reballasting work was recently completed in Polhill Tunnel, on the main line to Folkestone and Dover, which is 1½ miles long, penetrating chalk hills on a gradient of 1 in 143. With the aid of derrick wagons coupled to a diesel locomotive, lengths of prefabricated track were placed exactly in position ready for laying in place of the old, one every few minutes. About 1,188 tons of steel rails, chairs and sleepers and 4,700 tons of ballast were removed and replaced. Mechanical excavators were employed and 260 men were engaged. The whole restoration work was completed within three weeks ready for traffic, which had mostly been diverted meanwhile. Many steam and electric trains pass through Polhill.

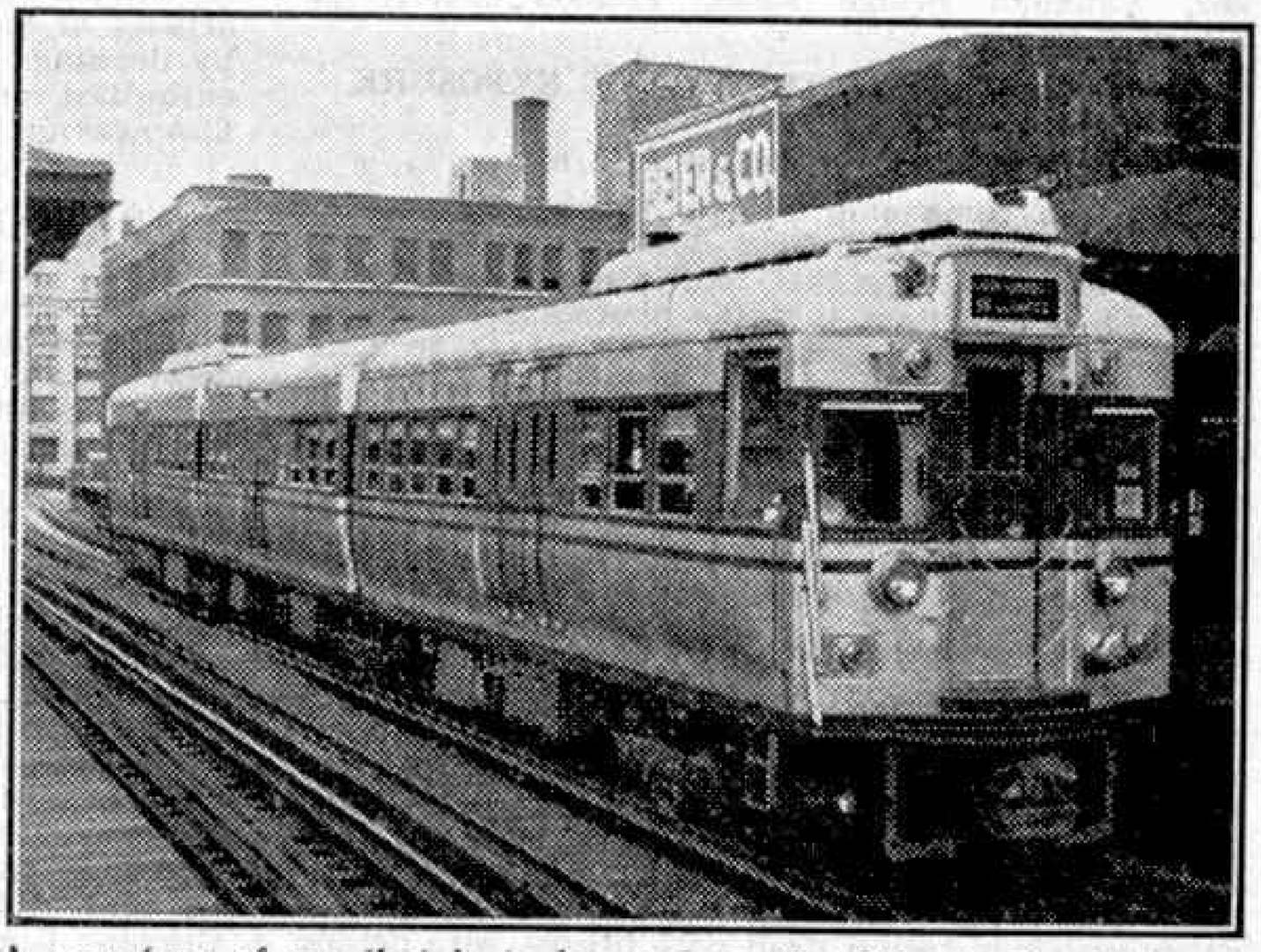
Three million passengers were carried in Southern ships between Portsmouth and the Isle of Wight last year. Two new motor vessels named "*Southsea*" and "*Brading*" are building for this service and will be the largest used on the route, accommodating 1,400 passengers and developing a speed of 14½ knots. A new diesel-electric passenger and car ferry is also operating between Lymington (Hants) and Yarmouth, Isle of Wight.

### New Cars for Chicago Elevated

The first car of a new type was delivered recently for trials on the Chicago Elevated and Subway Lines, now part of the Chicago Transit Authority.

Each car is in three sections or compartments with an overall length of 88 ft. 7½ in. and a seating capacity of 96. The body is of aluminium alloy with a red strip, and has convex-concave side contours to allow of greater seat width. All windows are of safety glass.

The two trucks at each end of the car form an independent four-motor unit; a maximum of six articulated cars can be coupled together in one train. The bogies are similar to those used in the P.C.C. type of car on street tramways, and the electrical control equipment is also a modification of the P.C.C. type incorporating dynamic braking. H. E. MEATS.



**A new type of car that is to be used on the Chicago Elevated and Subway Lines. Photograph by E. E. Keevil.**

# BOOKS TO READ

*Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller.*

### "THE STORY OF THE WEST HIGHLAND"

By GEORGE DOW (British Railways. 3/6)

In the December 1944 "*M.M.*" we reviewed Mr. Dow's "*The Story of the West Highland*," published in connection with the Jubilee of the opening of the 100-mile route between Craigendoran and Fort William. Now we have a second and enlarged edition of this excellent booklet, including special references to the work of the line during the war, which were necessarily omitted from the first edition. For instance, we have the story of the military port Faslane, built in the greatest secrecy on the shores of the romantic Gare Loch. This and many other installations of various kinds meant the handling of greatly increased traffic on a line with its own peculiar operating difficulties.

With its 65 illustrations, its map and its four useful appendices, the booklet forms a worth-while addition to current railway literature. It was the last publication of the L.N.E.R., and copies may be obtained from the station bookstalls at Edinburgh, Glasgow, Helensburgh, Fort William and King's Cross, and from Messrs. Elliot's bookshop in Princes Street, Edinburgh, price 3/6, or from the Advertising Manager, British Railways, Eastern and North Eastern Regions, 26, Pancras Road, London N.W.1, 3/9½ post free.

### "OVERGROUND"

By STANLEY NEWMAN (Ian Allan Ltd. 2/6)

This 40-page booklet gives a pictorial record of the developments of London's buses, trams and trolley buses from the early 1900s up to the present time. The story is concise, but adeqate, and most of the many interesting illustrations are exceptionally good. The greater part of the book is devoted to motor buses and coaches, of which a large variety of types is illustrated, but steam and horse buses and experimental vehicles also are included. The trolley bus section illustrates the first vehicle of this type to appear in London, with other classes up to and including the Standard 13 class of the present day.

The booklet cannot fail to interest all who study road passenger transport. Copies may be obtained from booksellers at 2/6 or direct from Ian Allan Ltd., 282, Vauxhall Bridge Road, London S.W.1, at 2/9 post free.

### "THE TABLOID PHOTOGRAPHIC EXPOSURE GUIDE"

(Burroughs Wellcome. 2/6)

This is a companion volume to the well known Wellcome Photographic Year Book. It is small, and easily carried in the pocket, and in its 32 pages there is all the information that the photographer desires when selecting and arranging his subject, or deciding upon diaphragm and shutter settings, and this is arranged to make reference easy. Special attention is given to the arrangement of the sitter and lighting in portraiture, and the selection of view points in outdoor photography. The "Wellcome" exposure calculator also is reproduced in miniature, to complete a compact and invaluable photographer's companion.

### "ENGLISH NARROW GAUGE RAILWAYS"

R. W. KIDNER (Oakwood Press. 2/–)

There is a special fascination about narrow gauge railways, and it is unfortunate that many of these lines previously in operation in this country have been closed. In its present form Mr. Kidner's book on them reaches its third edition. It follows the usual Oakwood Press style. Each English narrow gauge system in turn is dealt with briefly, with details of motive power and rolling stock, small maps and sketches of some of the different types of locomotives. Reproductions of photographs also are included, and these show well the diverse equipment once encountered on narrow gauge lines in this country.

Copies of the book can be obtained from the Oakwood Press, Tanglewood, South Godstone, Surrey, price 2/3 including postage.

### "LOCOMOTIVES OF THE SOUTHERN REGION OF BRITISH RAILWAYS"

(W. G. Tilling. 5/–)

For many years the handbooks of Mr. Tilling have been the standby of locomotive enthusiasts specially interested in the engines of the former Southern Railway. Now the various "Tillings," the first of which dates back to 1920, are combined into one book.

An introductory section deals with the S.R. and its development from the pre-group constituent companies, and there are some general notes on locomotive matters, including sheds and numbering schemes. Then follow various sections dealing with the work of each of the principal Locomotive Superintendents and Chief Mechanical Engineers from Stroudley, Stirling, Kirtley and Adams down to Bulleid.

Tables in numerical order give class details, types, building dates and names of the engines they built and there are many excellent full page illustrations.

Copies of the booklet are obtainable from the author at 106, Great Dover Street, London S.E.1, price 5/4 including postage.

### "HANDICRAFT IN PLASTICS"

By BENJAMIN T. RICHARDS (Bell. 3/6 net)

In the past wood and metal have been the chief materials used in handicrafts, but the ever-increasing range of plastics has greatly extended the opportunities for model-builders by providing them with new decorative materials that are easily manipulated. Mr. Richards has obviously given skilled attention to the possibilities, and has developed the very interesting scheme outlined in his book. In it he describes four special plastics readily available for handicraft purposes, and explains how to work them. The greater part of the book is devoted to actual constructional work, dealing with a range of useful articles of increasing complexity, all well illustrated by drawings. After working through the course the enthusiast for this new form of handicraft will readily find new applications for the technique suggested.

### "RATTY"

By W. MCGOWAN GRADON, B.A. (8/6 net)

"*Ratty*" is the story of the narrow-gauge Ravenglass and Eskdale Railway in Cumberland, which has been given this nickname by the dalesfolk of the district served. It began as "*Owd Ratty*," a 3 ft. gauge line opened in 1875 and closed down in 1912. In 1915 came "*Laal Ratty*," its 15 in. gauge successor, and in more recent years a standard gauge line was laid outside the 15 in. track over part of its course. All this, and very much more is told here in detail. Engineering features, motive power and equipment are described, with stories of the personalities connected with the line, and there are plenty of excellent illustrations, with diagrams of station layouts and a gradient profile.

The book will be enjoyed by all railway enthusiasts, but many will regret that the author did not show a little more care and consistency in dealing with the names of locomotives and personages associated with the line. Copies are obtainable from W. McGowan Gradon, B.A., "Pear Tree Cottage," Oldfield Lane, Altrincham, price 8/10 including postage.

# Photography

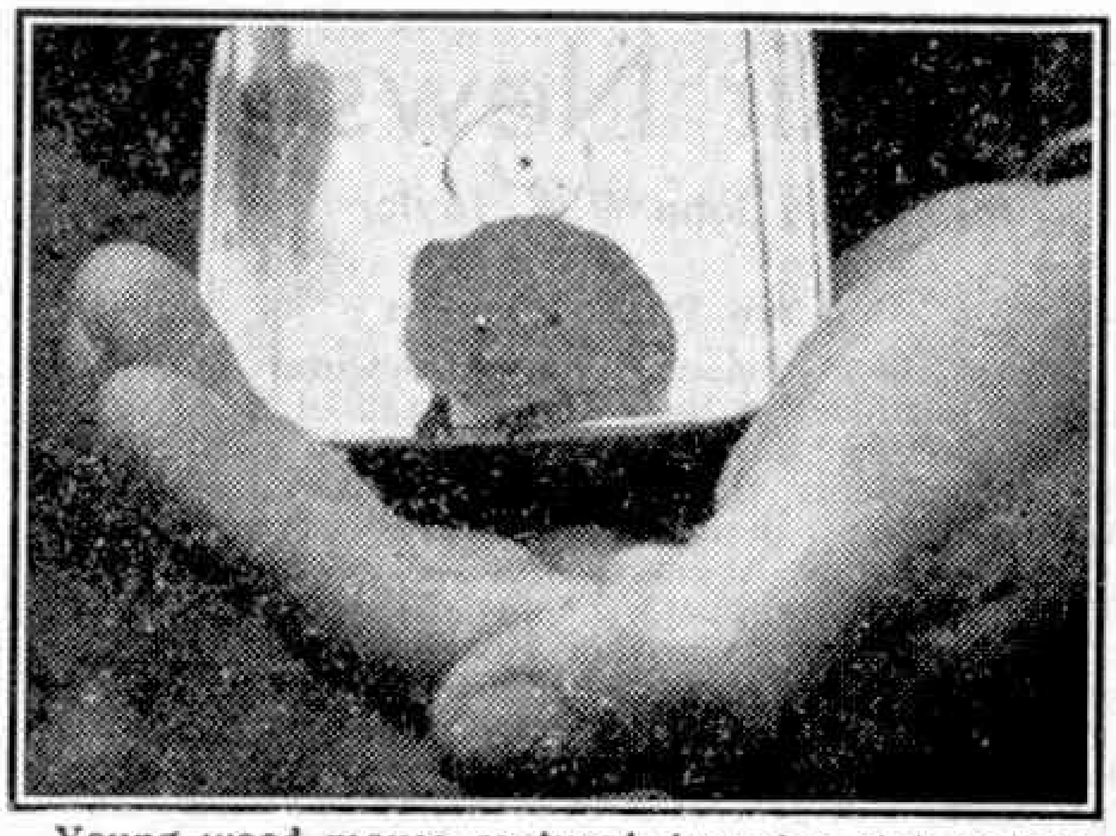
## On Club Outings

By E. E. Steele

IN most large towns there are Camera Clubs where the amateur can gain information, and also improve his photography in a practical way by taking advantage of the club outings during the open air season. Other societies cater for different tastes, but the photographer can always find plenty of opportunities for picture making on outings arranged by whatever club he belongs to.

"What have I got?"

For example, I am a member of the Lincolnshire Naturalists Union. During the Summer months we hold field meetings in various parts of our country, and often enjoy the privilege of roaming over large estates usually closed to the general public. Apart from interesting scenery there is much to see, for our members are experts in most branches of nature work, and rare flowers, birds and insects are frequently discovered and identified on the spot.



Young wood mouse captured during a club outing.

In recent years the Union has attracted numbers of young people, particularly boys from the various secondary schools, who take a great interest in collecting specimens. All these activities provide endless material for camera work. The members are often so absorbed in what they are doing that it becomes quite easy to take their photographs unaware to them.

Although shots of the whole group can be made during the outdoor lunch, or while on trek through the parks, the close-up is usually best for showing the individual interests of the members. Our way lies by woods, fields and streams, as shown in the illustrations, and the party splits up into little groups, each with a common interest, all meeting again at a given point for that most important item, tea. This is followed by discussion of the day's finds, and identification of specimens by the experts.

Exploring the grounds of Grantham Castle

# Air News

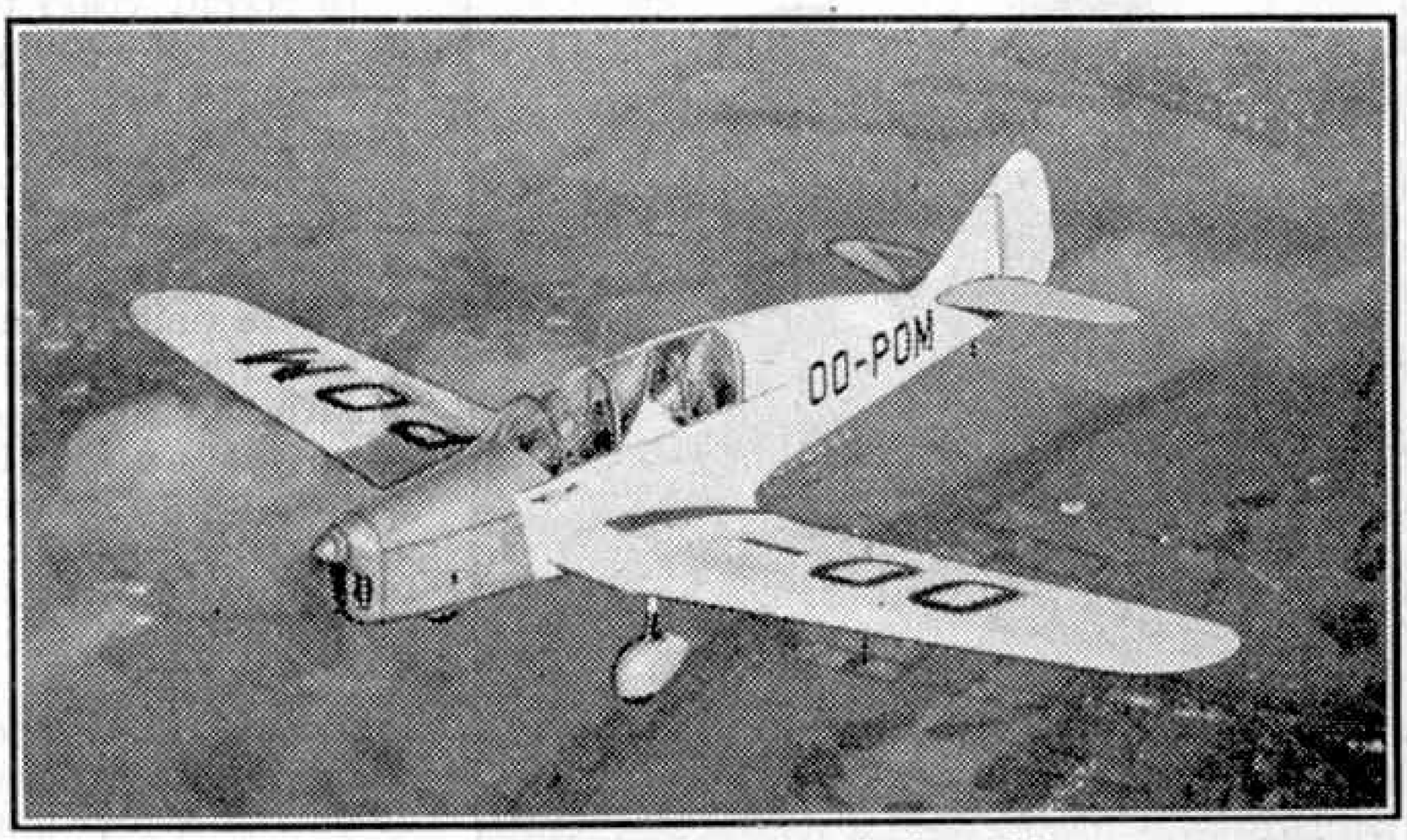
By John W. R Taylor

### New Primary Trainer

When the Germans overran Belgium in 1940, several members of the technical staff of the Avions Fairey factory at Gosselies succeeded in escaping to Britain. Among them was the managing director, Mr. E. O. Tips, designer of the Tipsy series of light 'planes built by Avions Fairey. Another "refugee" was his latest product, the little Tipsy M two-seat trainer, which remained in Britain during the war years.

This aircraft has now been re-designed as the Fairey Primary Trainer, incorporating several new and interesting features. It is an orthodox low wing monoplane, powered by a 145 h.p. "Gipsy Major" engine and fitted with a fixed, spatted undercarriage. Basic structure is of metal, with wooden ribs and formers, covered with plywood and fabric. Because of an ingenious "waisted" enclosure over the cockpits, the view from the rear cockpit is almost identical with that from the front one, a useful feature in a training aircraft. The all-round view from both seats is excellent and full dual controls are fitted.

The Fairey Primary Trainer is delightful to fly and is fully aerobatic. At an all-up weight of 1,826 lb. it has a maximum speed of 135 m.p.h. and an endurance of over three hours. It should make an ideal replacement for the veteran "Magister," now in service with so many air forces.




**The Fairey Primary Trainer described on this page.**

### The R.A.F.'s New Inflatable Exposure Suit

Inflatable exposure suits for "ditched" aircrews, recently tested under service conditions in wintry seas, may soon become standard R.A.F. issue. The suit consists of two layers of rubber, and rolls up into a bundle so small that it fits into a pocket in the collar of the "Mae West." It is inflated by the wearer after being put on, and gives air insulation against cold and damp, which are the biggest trials of "ditched" aircrew at sea.

The exposure suit was given one of its tests under working conditions in the Moray Firth. An aircrew of five from R.A.F. Kinross took to their dinghy well out at sea from Invergordon, and wearing the new suits, paddled their rubber boat until a "Lancaster" from R.A.F. Leuchars dropped an airborne lifeboat by parachute. This the "ditched" airmen navigated safely into Burghead unaided. They all expressed themselves as more than satisfied with the protection against exposure given them by the suits.

### Another B.O.A.C. Service

British Overseas Airways Corporation have opened a new once-weekly service across the Indian Ocean, connecting Ceylon and Singapore. "Lancastrian" aircraft, converted to carry 13 passengers, mail and cargo, are used, and complete the 1,777-miles journey non-stop in eight hours. Leaving Colombo each Thursday, this service connects with the weekly one from the United Kingdom to Ceylon, which arrives at Colombo the previous evening. It operates from Singapore on Saturdays, connecting at Ceylon with the Sunday service to London.

### The New Altitude Record

On the 23rd March last John Cunningham, chief test pilot of the de Havilland Aircraft Company, broke the International Altitude Record for aeroplanes with a magnificent climb to 59,492 ft. in a "Vampire" jet fighter. A special article on this fine British achievement will appear in next month's "*M.M.*"

### "Shooting Star" Jet Fighters for U.S. Navy

The U.S. Navy has chosen the Lockheed "Shooting Star" for jet combat training, and 50 of these jet fighters have been ordered. At present the Navy is operating two "Shooting Stars" at the Point Mugu guided missile experimental station, where they are used for tracking and photographing guided missiles and occasionally for shooting down missiles that have gone out of control.

### Postscript on Helicopters

Since I wrote my article "*Helicopters at Work*" (see page 146) news has come from America that these aircraft are already being used extensively by the American Post Office. In California, Los Angeles Airways are flying a shuttle service and two circle routes between major post offices in Los Angeles and its suburban municipalities. Operating with Sikorsky S-51s, sometimes from the flat roof of post office buildings, they are speeding air mail delivery by as much as 24 hrs. The system is being extended to other American cities, including New York and Chicago.

Early in February last a Westland-Sikorsky S-51 gave a convincing demonstration of the usefulness of helicopters for specialised duties, when it was flown to within a few feet of the top of Wolf Rock lighthouse in bad weather, and hovered there while supplies were lowered to the keepers. The men had been cut off by heavy seas far beyond their usual time of relief, and their supply position was getting desperate until the helicopter arrived.

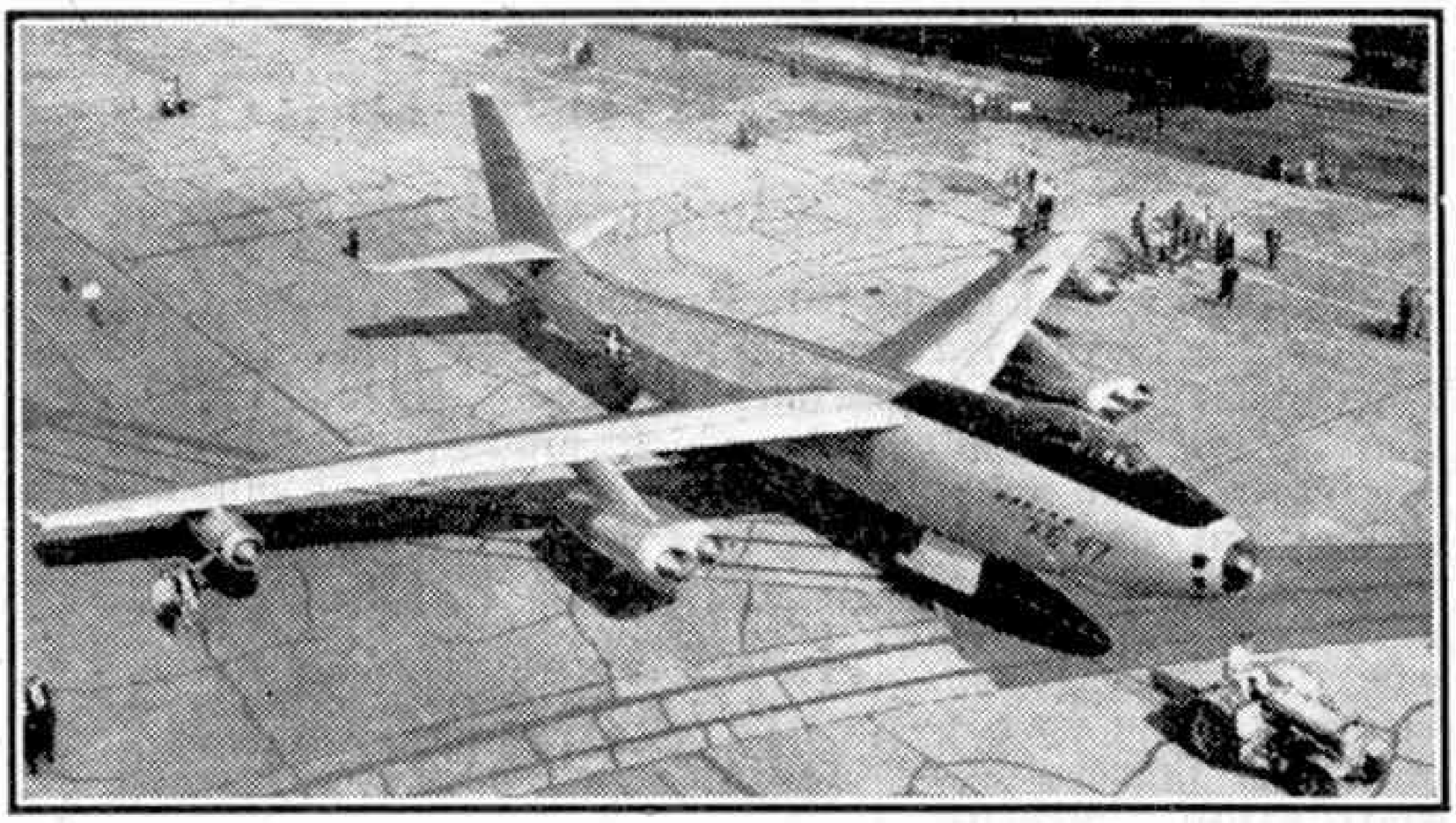
### Lightweight Automatic Pilot

Following two years of research the British Sperry Company have perfected a new automatic pilot known as the "Pilot Aid," which weighs only 17½ lb. It is designed primarily for aircraft with an all-up weight not exceeding 15,000 lb., and is, in fact, the lightest auto-pilot on the market.

The "Pilot Aid" works on the pneumatic-electric principle and consists of five separate but interconnected units. The control unit includes devices enabling the pilot to apply banked turns, or to climb and dive within the limits of 20 deg. roll and plus-and-minus 10 deg. pitch, and to vary the "stiffness" of the control to suit rough and smooth air conditions.

## New Boeing Military Aircraft

Since the first "Flying Fortress" was produced in 1935 the Boeing Aircraft Company have built up a great reputation with their bomber aircraft. Boeing B-17s spearheaded the assault of America's Eighth Air Force against Nazi Germany, and B-29 "Superfortresses" took over in the war against Japan, speeding that war to a close by dropping the atom-bombs. Thus, it is hardly surprising that Boeing's first jet bomber is something outstanding. So too is another new Boeing aeroplane, the XL-15, although its engine develops about a fortieth of the power of one of the bomber's jet engines. Together these two new aircraft form a preview of to-morrow's air power; they are shown in the photographs on this page.



**Boeing XB-47 jet bomber, showing the sharply swept-back wings and arrangement of the six jet engines. The photographs on this page are by courtesy of the Boeing Aircraft Company, U.S.A.**

### Boeing XB-47

The XB-47 is no conventional bomber with jets installed in place of piston engines. It was designed from the start to make full use of the tremendous increases in speed made possible by jet propulsion, and incorporates every modern aid to high-speed flight. Its wings and tail surfaces are sharply swept back and are so thin in section that the wings "droop" slightly while the 'plane is on the ground. In flight they rise to a level slightly higher than horizontal.

Unofficially named "Stratojet," the new bomber is about the same size as a "Superfortress," with a wing span of 116 ft. From nose to tail it is a picture of smooth elegance. It is fitted with six General Electric jet engines, four of them slung in pairs under the inboard section of the wings, the others mounted singly near the wing tips; and to supply extra power for take-off or in action 18 rocket take-off units are located in the sides of the fuselage aft of the wings. To eliminate the need for wheel wells or bulges in its wings the XB-47 has two double-wheeled undercarriage units in tandem beneath its fuselage, with two "balancer" wheels under the inner engine nacelles, like the Martin XB-48. The tandem theme is repeated in the cabin, where pilot and co-pilot sit behind each other under a fighter-type Plexiglass canopy.

That is all that can be said about the new bomber at present, except that it flew for the first time on 17th December last, has an estimated top speed of 620 m.p.h. and can carry an atom bomb.

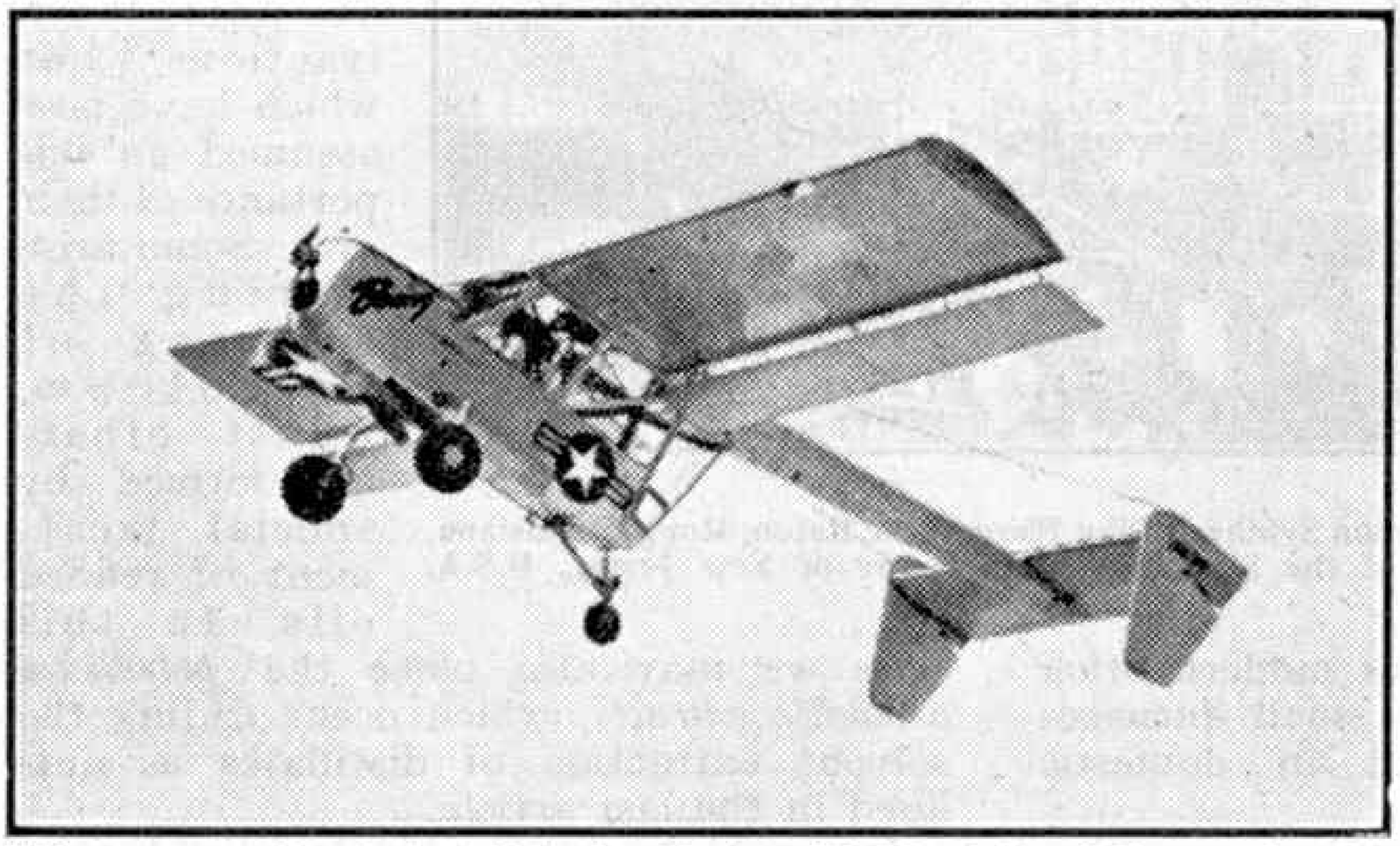
### Boeing XL-15

This little aircraft was designed to meet an almost impossible set of requirements for a new army observation and general duties machine. Its designers have succeeded, even if the XL-15 does look like nothing that has ever flown before! The fuselage is little more than a Plexiglass gondola slung under the wing and with a 125 h.p. Lycoming engine in the front. As a result, the pilot and observer have an unprecedented field of view up, down and all round. Sticking out behind and above the fuselage is a cylindrical boom, at the end of which is an "upside-down" tail unit.

The performance of the XL-15 is as surprising as its appearance. It will take off and clear a 50 ft. obstacle in 600 ft., cruise at 101 m.p.h. and land at 35 m.p.h. Full-span flaps enable the machine to fly at speeds less than 50 m.p.h. yet it can dive away out of any trouble at 200 m.p.h. It can be quickly dismantled and loaded onto a standard 2½-ton army lorry or, with its propeller still in place, can be towed glider-fashion by another aircraft at speeds up to 165 m.p.h.

Large balloon tyres, which facilitate operation from rough, muddy fields, can be exchanged for floats or skiis if desired. Although no provision is made for any defensive armament, both crew members are protected by armour plate, and as a safety measure the observer has a duplicate set of basic flying controls so that he could land the aircraft in an emergency.

The XL-15 has a wing span of 40 ft. and weighs less than one ton. The first contract placed by the U.S. Army is for 10 production machines, but this is likely to be substantially increased after the aircraft's operational trials.



**This unconventional aircraft is the Boeing XL-15, designed for use by the U.S. Army Ground Forces.**

# Oil for Britain

## IV. Chemicals from Petroleum

THE products of crude petroleum may be simply divided into four classes. The first and most important of these contains all the compounds which are derived from the crude by *Refining*. That is, they are compounds which were in the crude when it left the well, and they are yielded by the separation and purifying processes—distillation, solvent extraction, chemical treatment—described in the last two articles. A brief list of the typical main products of petroleum refining is as follows:

(*a*) Straight run gasoline, once used as motor fuel but now almost always employed in conjunction with additives, or blended with other types of gasoline (see below) before being employed as a fuel for I.C. engines, because the anti-knock properties of *straight* gasoline are inadequate for modern I.C. practice.

(*b*) White Spirit, and other light fractions used as solvents in such applications as dry cleaning, the extraction of oils and fats, and in the rubber, paint and printing industries.

(*c*) Kerosene, whose chief use is as a fuel for tractors, cookers, lamps, heaters, etc.

(*d*) Gas Oil, used as Diesel engine fuel; for making the familiar "oil gas" of Town Gas Works, and as fuel for modern brick kilns or other relatively small furnaces such as those employed in domestic heating installations.

(*e*) Paraffin Wax, for candles, cosmetics, polishes, wax proof paper, etc.

**The four articles in this series were prepared by the Public Relations Department of Manchester Oil Refinery Limited, to whom due acknowledgment is made.**

(*f*) Medicinal liquid paraffin, with whose applications the reader is no doubt familiar!

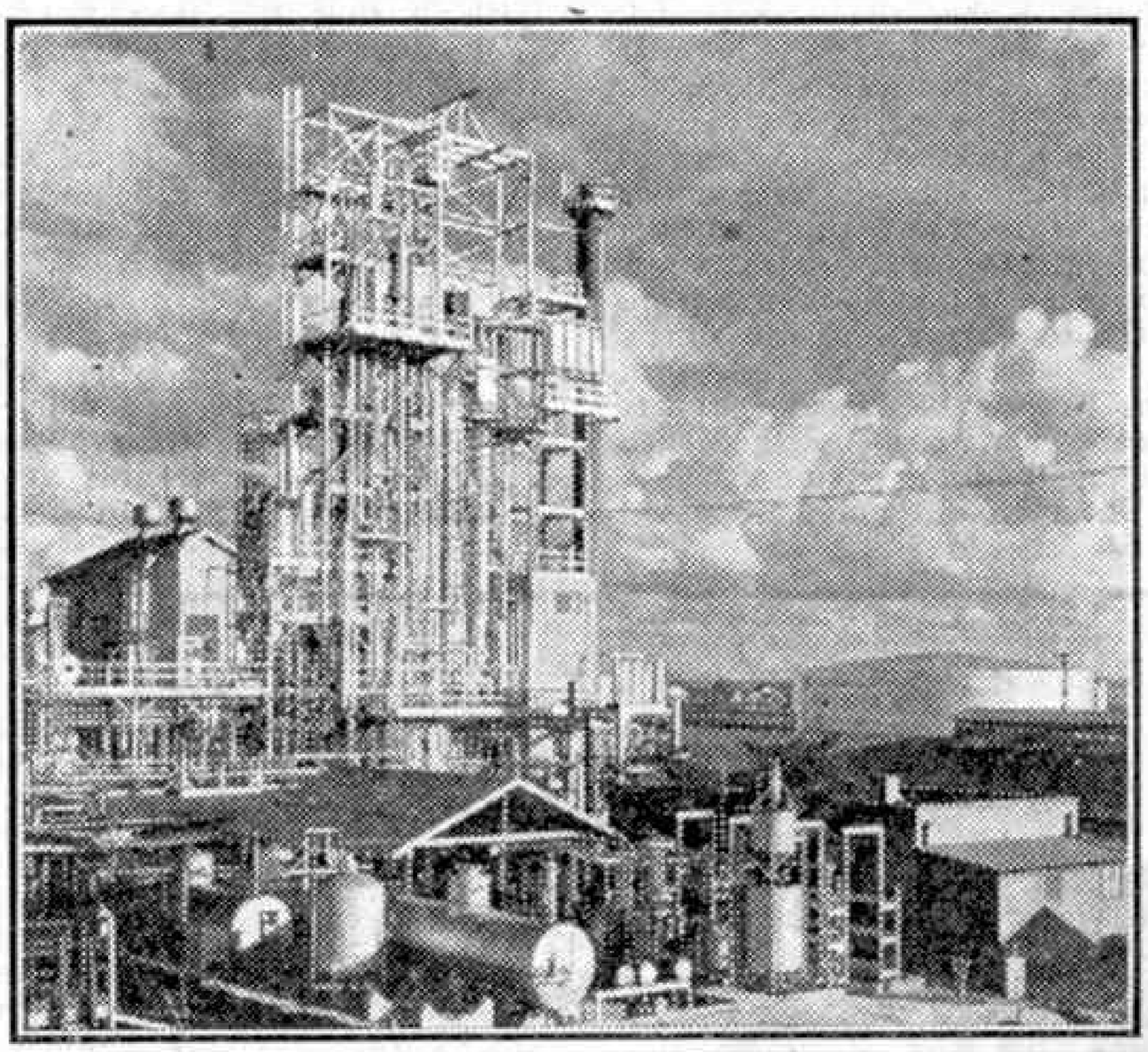
(*g*) "Technical White Oils." These must be of sufficient purity to be employed in food manufacture, and are also used in cosmetics, agricultural sprays, in the textile industry and as light lubricating oils.

(*h*) Transformer Oils, whose high stability and freedom from impurities render them ideal for electrical insulation in transformers and switch gear.

(*i*) Lubricating Oils, which will be well known to the mechanically minded readers of the "*M.M.*"

(*j*) Asphaltic bitumen, used in road making, the preparation of roofing materials, plastics, etc.

This short list shows the widespread way in which just one class of petroleum products enters into our daily lives at every point.



**Hydrocarbon Synthesis Pilot Plant at the Baton, Rouge, Louisiana, refinery of the Standard Oil Company of New Jersey, U.S.A.**

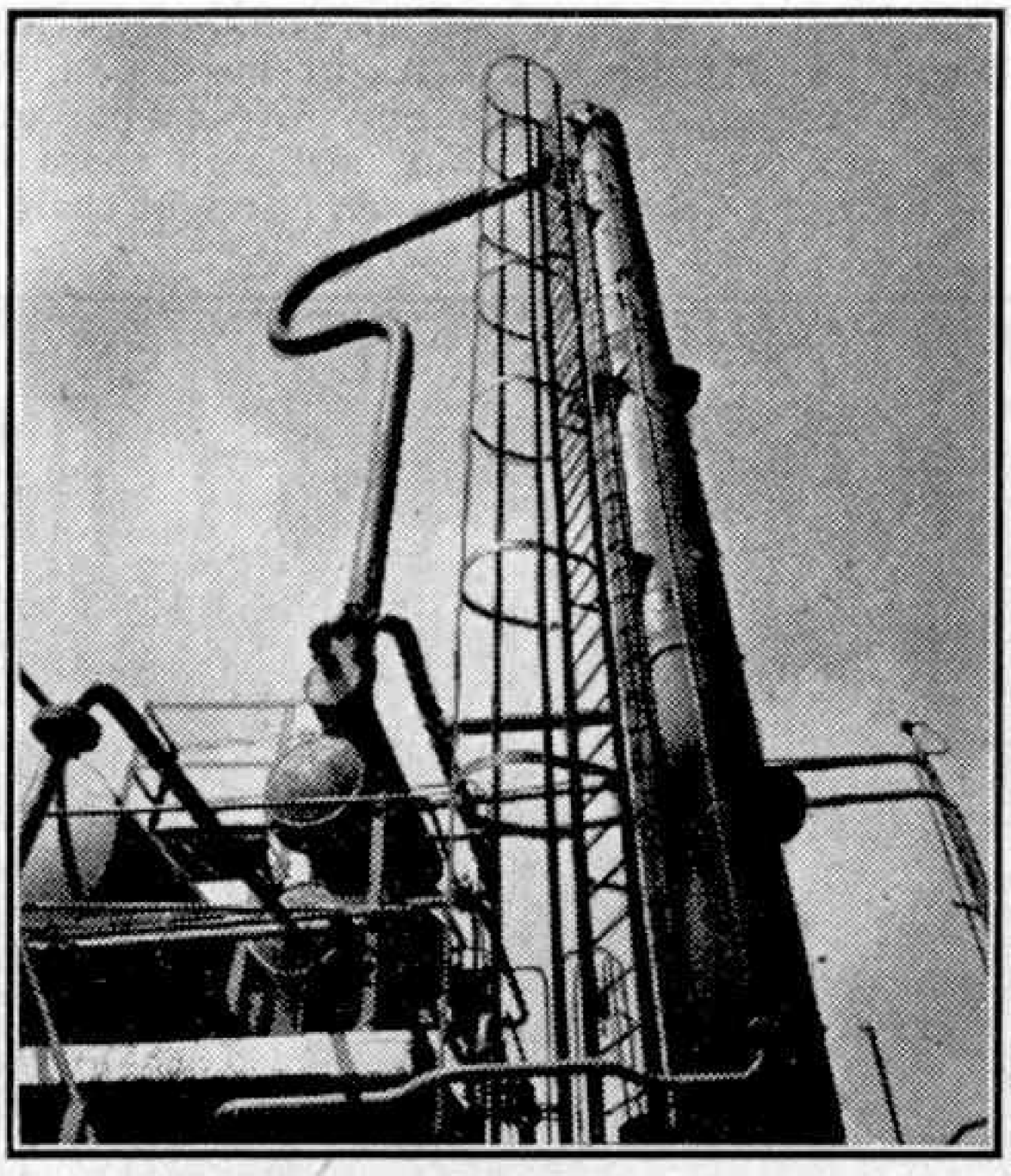
The second class of petroleum products are those which were originally produced as by-products from the treatment of petroleum fractions, but which have now assumed an importance of their own. Some arise during the refining of petroleum, whilst others are formed by special treatment of refined oils. In this class we may also place the *petroleum aromatic extracts*, which occur during the solvent extraction of distillates as outlined in the last article.

It would be impossible to give here a complete list of all the products in this

class. Those manufactured by Manchester Oil Refinery include: *fat-splitting agents*, derived during the acid treatment of liquid paraffin and used in soap manufacture; *water-soluble petroleum sulphonates* (in liquid or powder form for use as wetting agents and cleansers) derived during the oleum treatment of technical white oils; *Oil-soluble petroleum sulphonates*, which arise during the manufacture of white oils and liquid paraffin, and the range of *petroleum aromatic extracts*, used largely in the rubber, paint, printing ink and foundry trades in place of rosin or linseed oil.

The third class of petroleum products are the synthetic gasolines. After World War I straight run gasoline production was found to be quite inadequate to satisfy the ever increasing demand for petrol, and petroleum technologists began to look about for methods of converting more plentiful petroleum products, such as natural gas, topped crude (*i.e.*, crude containing no gasoline) gas oil, etc., into gasoline. At the same time methods were being developed to improve the anti-knock qualities of natural and synthetic gasolines, and all these processes may be considered under the general heading of synthetic gasolines.

In considering the development of gasoline production, it is important to understand the influence of engine design on fuel specification. The efficiency of a petrol engine increases as its compression ratio is raised. Consequently, the tendency in petrol engine design has been towards higher compression ratios; but in any particular case, if the compression ratio is raised beyond a certain figure the engine begins to "knock" and to develop less power. The use of higher compression ratios demands improved fuels with better "anti-knock" properties. The anti-knock value or *octane number* of a fuel is a measure of its tendency to knock when employed in a special test engine having a variable compression ratio. The development of fuels with ever-higher octane numbers has been an important aim of synthetic gasoline research during the past twenty years.



**Part of the distillation unit of the oil-soluble sulphonates plant at Manchester Oil Refinery.**

The first process to be considered is the straightforward cracking operation, developed mainly between the years 1925–1935.

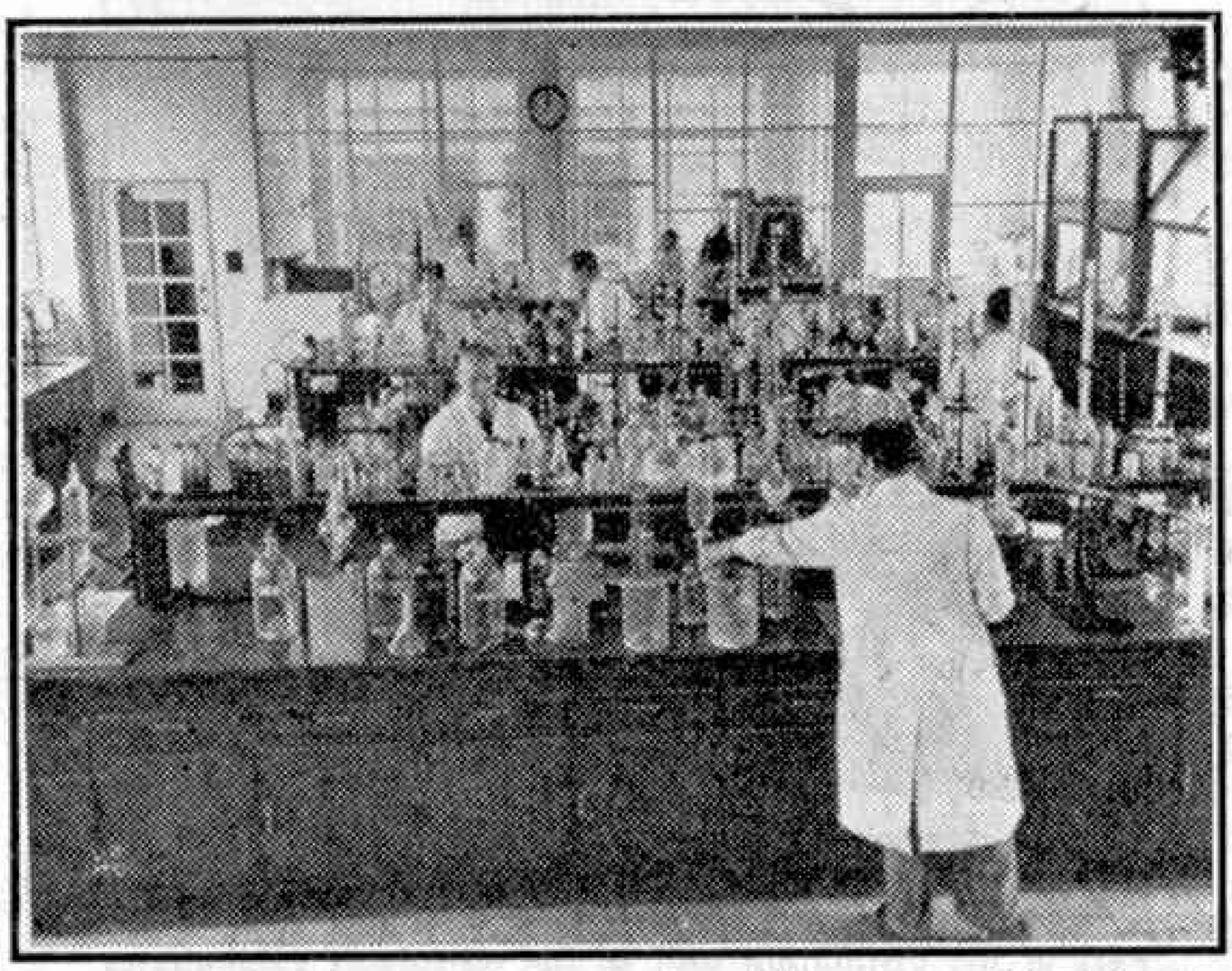
Cracking in theory is very simple. A feed stock of topped crude, kerosene gas oil or other heavy petroleum fraction is subjected to heat and pressure, upon which the large, high-boiling hydrocarbons split up and reform into smaller hydrocarbons of lower boiling point. Also, the yield contains *unsaturates* and *aromatics* not present in the charge, and, in particular, the *paraffins* are more *highly-branched* (see second article in this series, in the February 1948 "*M.M.*"), which means that the gasoline will have good anti-knock properties. In this way, part of the feed stock is converted into gasoline with a satisfactory anti-knock value.

In practice, the feed stock is first fractionally distilled along with the cracked products from a previous cycle, so that any light ends in the feed may be removed, and any heavy ends in the yield retained, and the heavy ends from this distillation pass through a tube still to the reaction chamber, where, at a temperature of from 800° F. to 1,000° F. and a pressure between 100 to 500 lb. per sq. in., cracking takes place. From the reaction chamber the cracked products pass eventually back to the fractionating column. The light ends after fractionating form the yield, and consist of cracked gasoline, and *olefinic* gases (see February "*M.M.*") evolved during the process,

about which more will be said below. The total yield of cracked gasoline, and the gasoline : gas ratio of the yield depend on the cracking conditions and, in general, the more severe the conditions, the higher the anti-knock value of the gasoline, but the smaller the yield in proportion to that of the gases.

A similar process is employed to improve the anti-knock value of the straight run gasoline distilled direct from crude; in this case the operation is termed "Thermal Reforming" and the yield consists of higher-octane gasoline together with (as previously), olefinic gases.

There also exist many variations of these processes employing catalysts, which make possible yields of much better-quality gasoline under considerably easier conditions of temperature and pressure; these operations are termed "catalytic cracking."



**A corner of the Research Laboratories at Manchester Oil Refinery.**

It has been mentioned that, during cracking operations of the above type, large volumes of olefinic gases are produced, and it was natural, that toward the middle of 1930s, methods of converting these olefinic gases into yet more gasoline, should have been developed. The general name for such processes is *polymerization*. Polymers are hydrocarbons having equal ratios of hydrogen to carbon atoms—such as Ethylene ($C_2H_4$) and Propylene ($C_3H_6$) and, in general, polymerization converts the lighter olefinics, such as Ethylene and Propylene, into their heavier polymers having formulæ such as $C_6H_{12}$, $C_7H_{14}$, etc. In actual fact, the chemistry of the process if much more complex than this, and to consider polymerization in more detail would land us in very deep water.

As with cracking and reforming, polymerization may be thermal or catalytic, although thermal polymerization as such is becoming obsolete.

Yet another process for the production of gasoline is Alkylation, in which a paraffinic gas such as *iso*-butane (Branched chain butane $CH_3—CH(CH_3)—CH_3$ see page 42, February "*M.M.*") is united with an olefinic gas such as butylene, yielding a gasoline of very high anti-knock rating suitable for aviation spirit.

As we have seen, there is an abundant supply of olefinic gases from cracking, but, although there is a good supply of *normal* (straight chain) Butane ($CH_3—CH_2—CH_2—CH_3$) evolved during the production of gasoline by any of the cracking processes, there is insufficient *iso*-butane. Hence the necessity of converting normal to *iso*-butane. The latter process is termed *isomerization*, and isomerization and alkylation are employed on other hydrocarbon gases as well as butane and butylene, to yield high octane aviation spirit. If the reader has managed to follow all this without confusion, he will have a good idea of the process employed in the production of present day petrol—perhaps the most important of our chemicals from petroleum.

The fourth and final class of petroleum chemicals are the hydrocarbon "bricks" which form the raw materials of our modern chemical industries. Until recently, all but a few of these "bricks" were obtained from coal-tar, but to-day, developments are taking place in petroleum chemistry which will make a complete range of basic chemicals available from petroleum.

In the first place, there is a large chemicals industry forming around the olefinic gases alone, and more particularly around ethylene, propylene and butylene.

Explosives, lacquers, synthetic rubbers, alcohols, artificial silks, plastics, glycerine, drugs, anæsthetics and many other products are, or can be, based on the olefines—either alone or in (*Continued on page 176*)

# Of General Interest

### FISH UNLOADED THROUGH HOSE

Fishermen spend days in getting a cargo, only to damage and lose as much as a twelfth of their fish in shovelling them from boat to cannery dock, and the process takes hours while the fish are not getting any fresher.

A New England canner, who had seen oil tankers unloaded by B. F. Goodrich hose, got the idea that fish might be handled in the same way. B. F. Goodrich studied the problem and then recommended a certain hose with a very soft rubber lining so that the fish would not be bruised as they had been by the hand method of shovelling. A method was worked out by which fish and water were sucked through the hose so that the water "floated" the fish smoothly on their way. The new system worked perfectly. Instead of hours by the old method, the B. F. Goodrich hose unloads a 65-ton cargo in minutes. Food is saved, fish reach the cannery fresher and boats get back to the fishing grounds sooner.

### A HUMMING BIRD'S HOME

The Louisville and Nashville Railroad runs a special express train called "*The Humming Bird*" between the northern states and New Orleans. Recently a humming bird's nest was found in the top of a beech tree felled near one of the towns it passes through, and the finder thought that this should be shown in the train named after its builder. Accordingly a glass case was made to accommodate the nest, a tiny masterpiece of oak and hickory leaves held in position by spiders' webs, and the case was mounted in one of the coaches of the train.

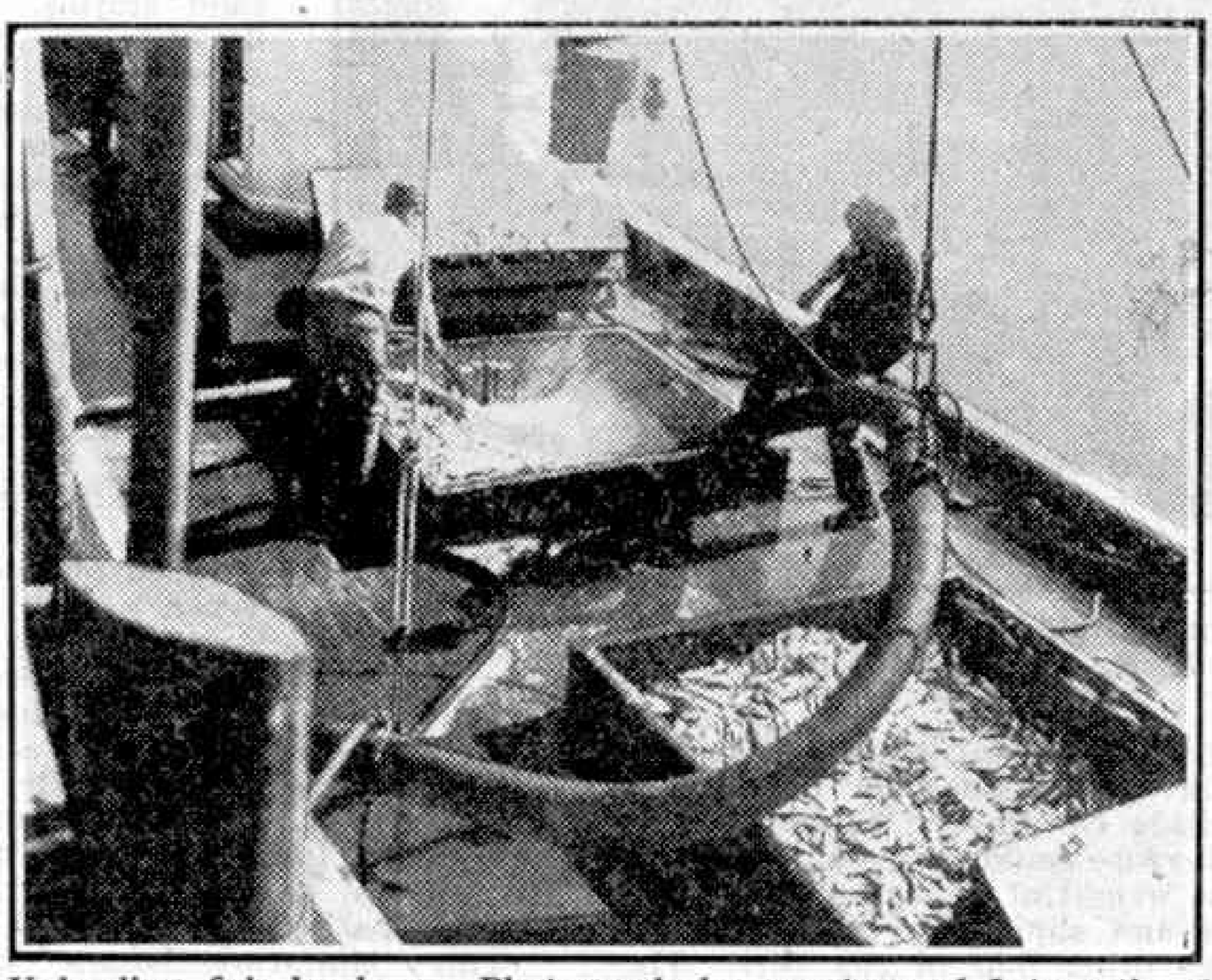
Humming birds are found only in the Western Hemisphere, and even there only one species, the ruby-throated humming bird, is native in the Eastern United States and in parts of Canada, whereas California and the West have nearly 20, and there are more than 40 species in Mexico, Central and South America. Many of these are gorgeously coloured and have been described as winged jewels. We are indeed apt to think of all of them as brilliant and gem-like in appearance, but actually there are many species that are just dull brown or grey. In many respects their most remarkable feature is their size, or rather lack of it. Some, the giants of the race, are as large as sparrows, but many are no bigger than bumble bees.

Small as they are, humming birds feed upon insects. They visit flowers in search of these, and this has given rise to the idea that they actually feed on the nectar of flowers, a mistaken impression. Certain humming birds have short bills curved in a semi-circle, and others have bills sharply turned up, these apparently being designed to allow the birds to search certain forms of flowers for the insects on which they live. Others known as swordbills on the other hand have long slender bills, either straight like rapiers or slightly curved, scimitar fashion.

### TRANSPORTING A GIANT SHEAR

A huge shearing machine claimed to be the largest in the world has recently been taken by rail from the plant of its makers, the United Engineering and Foundry Company, New Castle, Pennsylvania, to Takoni, Philadelphia, where it will be used by its owners, the Northern Metal Company, to cut large pieces of scrap steel from ships being dismantled. Before this machine was installed large pieces of scrap had to be cut by acetylene torches to give pieces small enough to be handled by the shears then in use.

The use of the big new machine, with its 60 in. cutting blade, will greatly speed up the reduction of scrap metal. It weighs 97½ tons, and for transport was loaded on its side on a well car, with steel rods welded to it and bolted to the car to keep it upright. Although a hole had been cut in the steel floor of the car to allow for low loading, the top of the load was 16 ft. 8 in. above rail level. The average speed was 4 m.p.h.; at one point the greatest allowed speed of 10 m.p.h. was reached, but had to be reduced as the machine began to sway.



**Unloading fish by hose. Photograph by courtesy of International B. F. Goodrich Co., Akron, Ohio, U.S.A.**

### NEW LIGHTING FOR FAMOUS LIVERPOOL CLOCK

The great timepiece on the Royal Liver Building, the huge 25 ft. dials of which are larger than those of the great Houses of Parliament Clock at Westminster, has now been re-equipped for illumination during the hours of darkness. Like all other illuminated public clocks, it was blacked out during the war, and when the time came to light it up again, it was decided that advantage should be taken of the technical improvements in electric lighting. Experiments were accordingly made with a number of alternative types of lamps, and as a result of these, sodium lamps were chosen as the most efficient. Six of these have been arranged symmetrically behind each dial, with opal screens alongside to assist in the diffusion and to improve the even distribution of the light. As a result, the visibility of the clock has been greatly improved.

This great electric clock is very unusual, for although it has four dials, only three appear on the main clock turret above the river front, the fourth being on the similar turret at the other end of the building. Each of the dials is separately driven by a special type of motor pendulum mechanism, which propels the hands forward with great power, but is under the control of a precision master clock. The individual driving of the great hands was necessary because no master clock could jump the huge hands in the way smaller clocks are driven.

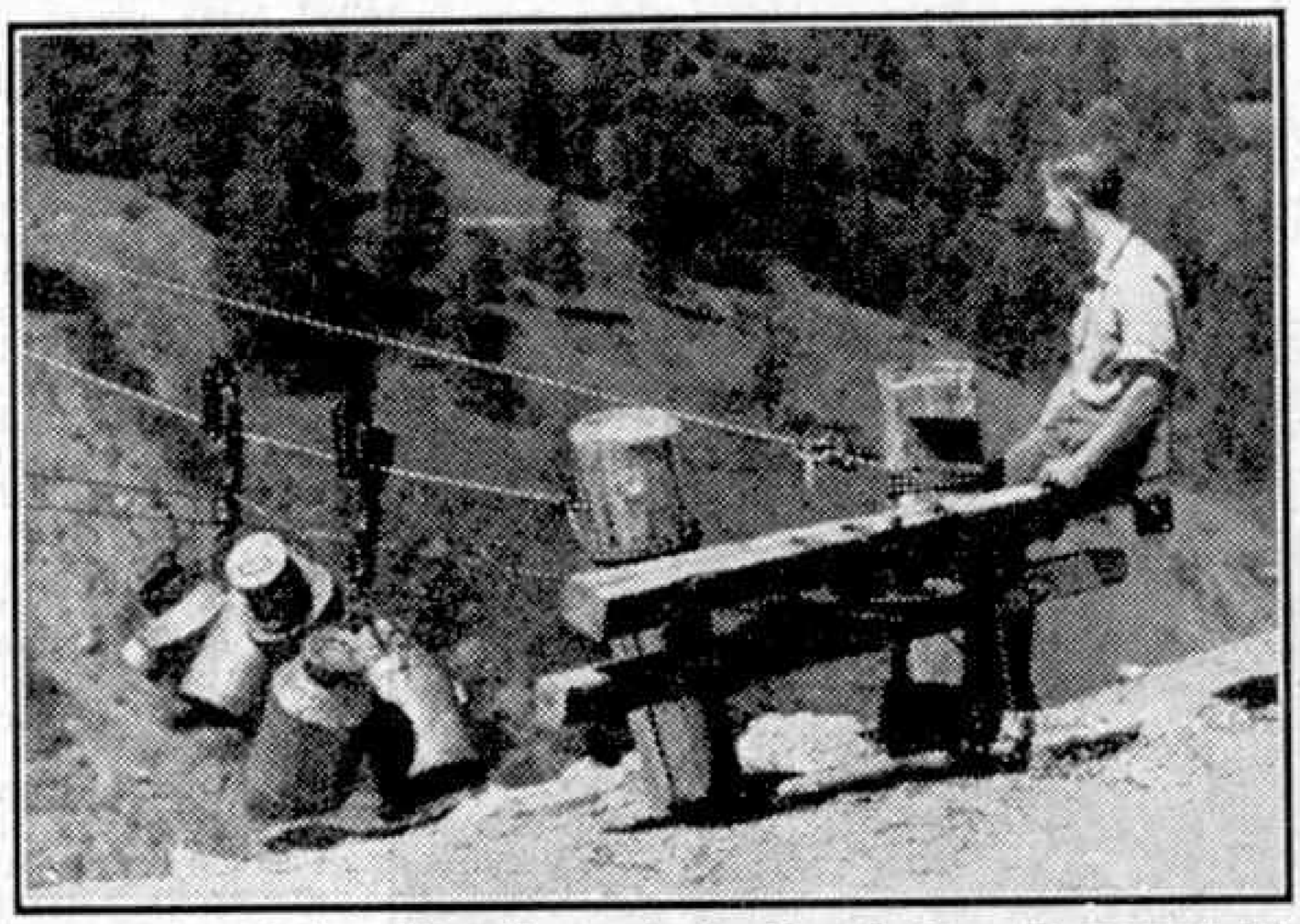
T. R. Robinson.

# From Our Readers

*This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.*

## ALPINE MILK DELIVERY

In the Alps many farms lie on high mountain pastures remote from roads. To overcome the problem of delivering fresh milk from them to collection points, pulleys have been erected both on mountain sides and main roads. By means of cables moving over these, full milk churns slung on fixed wires descend to the roadside by gravity, often bridging deep valleys that otherwise could scarcely be crossed. At the same time the weight of the full churns hauls up returned empties and supplies of various kinds to the farms, on the other half of the wire. The accompanying illustration shows the lower end of one of these useful mechanisms on the Col d'Allos in the French Alps, with a load of milk churns suspended from the wire.



**The lower end of a milk cableway in the French Alps. Photograph by R. R. Bushell (Hoddesdon).**

R. R. Bushell (Hoddesdon).

## ENGLAND'S HISTORIC CHANTRIES

At Bradford-on-Avon, St. Ives, Wakefield, and Rotherham are to be seen England's few remaining bridge chantries. These tiny chapels were erected some five or six centuries ago. They are unique in that their foundations are built into bridges over the rivers in these various towns, so that they stand about halfway across the river.

It appears that bridge chantries soon become obsolete as places of worship, and it is recorded that during the years they have been put to many odd and varied uses. They have served as river lighthouses, warehouses, lock-ups, cheesecake houses, dwelling houses and even ammunition depots. The one at Wakefield is now regularly used as a chapel again, to which it reverted, after a long run of different tenants, exactly 100 years ago.

F. R. Undy (Wakefield).

## SHIFTING SANDS IN SCOTLAND

It is interesting to find that there is an extensive waste of shifting sand in the North of Scotland, on the southern shore of the Moray Firth. The Culbin Sands, as this area is called, are near Forres, "the Brighton of the North," in Morayshire. Even on the hottest day they are never still. They stretch for many miles, and form huge mounds under which is the old village of Findhorn, which has been buried for many a year.

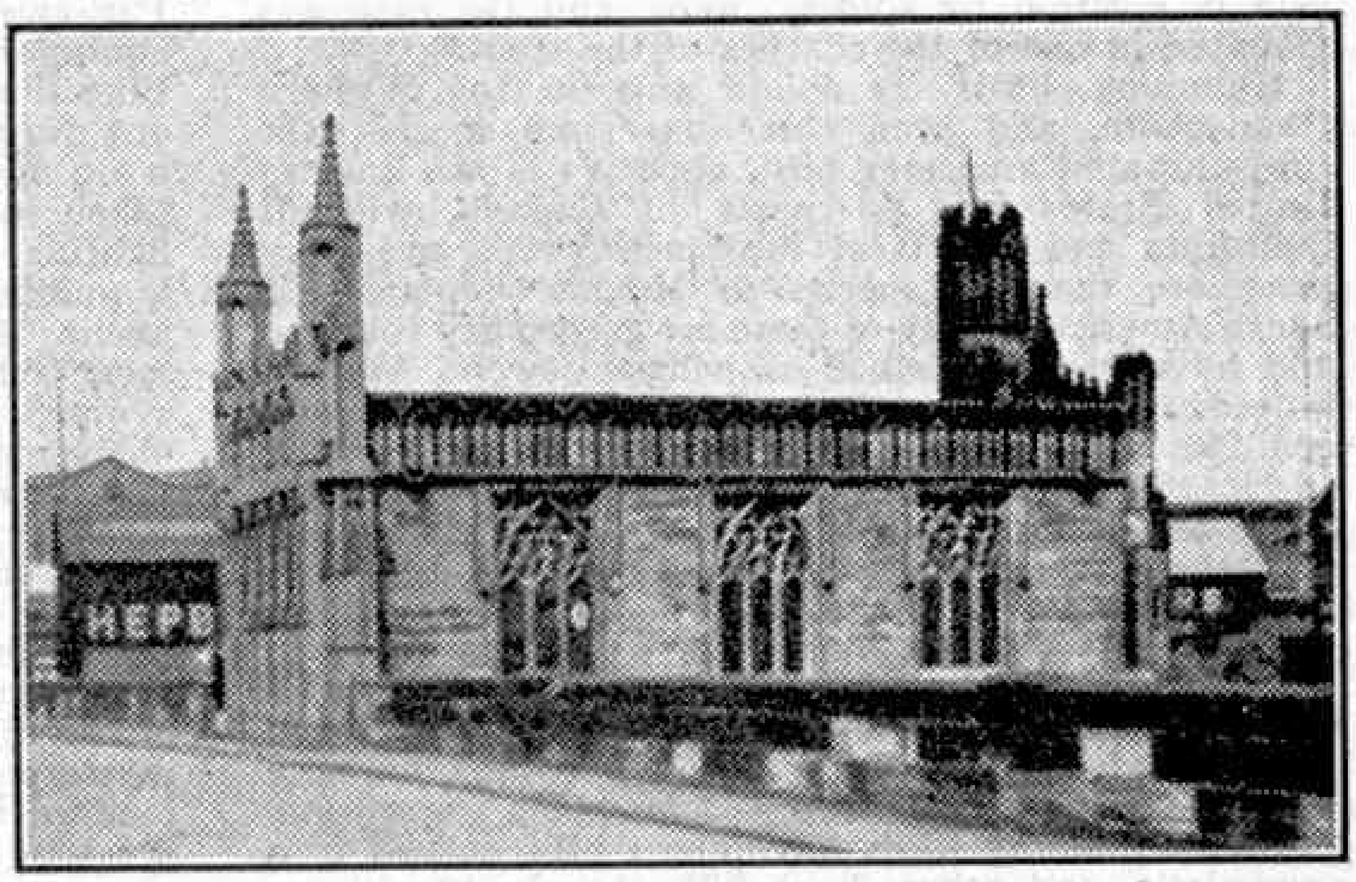
Crossing the sands is a difficult task, as one has to encounter fierce sand storms, and a good sense of direction is necessary. Owing to storms and the movement of the sands it has been impossible to excavate the ancient village, but visitors crossing or trying to cross the sands have stumbled upon ancient relics, such as arrow heads and flints, and several have even claimed to have seen the roofs of the houses, laid bare at times by rough gales.

Efforts to reclaim the area are being made by the Forestry Commission, who are planting trees on it. The scenes of many films have been photographed on the tops of the mounds. When a sand storm occurs, the sand is carried many miles, and on occasions it has had to be swept out of the streets of Forres, which is 4½ miles away.

The name of Findhorn has been given to another little village, one or two miles distant from the sand dunes. Its inhabitants are nearly all fishermen, and net salmon from their small blue boats. The fish is brought in, and carried up the stony shore, to be washed, packed and sent to the nearest town.

This "Miniature Sahara" is well worth visiting. It is not very far from Inverness and from Culloden Moor, the scene of the famous battle of 1745.

H. W. G. Wyeth (Alton).



**The Chantry Chapel on the bridge over the Calder at Wakefield. Photograph by F. Undy, Wakefield.**

# Club and Branch News

## WITH THE SECRETARY

### POINTS OF VIEW

Summer activities are now in the minds of Club officials and members alike. There is plenty to interest them in the outdoor world, and visits to works, outdoor games and excursions and rambles of all kinds will provide many pleasant hours during which members will learn to know each other better. Every feature of the outdoor programme must be arranged with some definite aim or purpose, even if it is only an hour's evening ramble, but there should be no difficulty in this respect. For instance, railways provide many view points where engines and trains of real interest can be seen, and these can be made objects of many trips. The exchanges of locomotives for main line services, to which reference is made in this month's "*Railway Notes*," will add to the interest of railway observation for members of Clubs within a reasonable distance of the lines over which "foreign" locomotives will appear. Enquiry should be made beforehand to ensure that there is something of special interest to be seen, but trouble of this kind is well repaid.

### CLUB AND BRANCH PHOTOGRAPHS

Photography should not be forgotten on these outings. In Clubs and Branches where a Photographic Section is in existence, this reminder will be unnecessary. In others there is usually at least one member who possesses a camera and outdoor meetings will give him splendid opportunities of making use of it, opportunities indeed that are limited only by the supply of films, and he could be asked to become Club photographer. Quite apart from objects of interest visited, he will find good scope in the activities of members themselves, who will enjoy being photographed in the novel surroundings visited on an excursion, and will be prepared to pay small charges for prints of good pictures in which they figure. No member will expect to profit from the exercise of his hobby in Club or Branch work, but it is only fair that he should be able to meet expenses in the manner I have suggested.

**D. Hargest has been Secretary of the Stroud Branch, No. 502, since its incorporation in July 1947. The Chairman is Mr. C. T. Hargest. Members of the Branch are organised in two sections, the "Eagles" and the "Kestrels." A good track is in regular use, and changes in the layout are made to give variety in operations.**

### SUMMER SCENES

During the past few years I have seen very few outdoor photographs of Club members in camp, on excursions or playing games, and I think the time has come to pay a little more attention to this. I shall be very glad to reproduce any good outdoor Club or Branch scenes during the coming summer, and I hope that I shall receive pictures of this kind from every one of those organisations that carry out a good summer programme. Photographs of the quality of competition entries are not required; what I am interested in is the information that these photographs give of Club activities, so send along all your snaps. I can promise to make good use of these.

While on the subject of photography I should like to draw the attention of Leaders and Chairmen to the publicity value of the reproduction in the "*M.M.*" of good group photographs taken in the Club or Branch room or out of doors, and the appearance of these gives real pleasure to members.

## CLUB NOTES

ABERDEEN GRAMMAR SCHOOL M.C.—Great variety has distinguished the model-building programme. A large crane is being constructed, and one ambitious member is trying to build an electric locomotive. A Hornby Train Night has been held. Club roll: 16. *Secretary:* D. N. Angus, "Knoyle," Coronation Road, Culter, Aberdeen.

PETERBOROUGH M.C.—Points are awarded for models constructed at the weekly model-building meeting, and excellent motor lorries, an excavator and a hand-car have been constructed. There is keen competition between the "Fishplates" and "Angle Brackets," the two Sections of the Club. A Meccano Quiz has been held, and Football and Darts have been played. Club roll: 6. *Secretary:* R. H. Booker, 110, Alexandra Road, Peterborough.

HUNTINGDON M.C.—Membership has increased considerably, notably in the Junior Section. Simple Model-building Contests have been held, entrants being allowed to use a limited number of Nuts and Bolts. A film projector has been obtained and is being put in order. A new Modelling Section has been started. Club roll: 60. *Secretary:* F. Saddington, 9, Avenue Road, Huntingdon.

NORWICH M.C.—Members of this newly incorporated Club are very enthusiastic. Meetings are held weekly, part of each being devoted to Meccano model-building and the rest to Games and General Knowledge Contests. The works of the local newspaper have been visited. Club roll: 14. *Secretary:* B. Ecker, 57, Prince of Wales Road, Norwich.

### AUSTRALIA

THEBARTON BOYS' TECHNICAL SCHOOL M.C.—Steady attendance and good general interest have improved the position of the Club. Visits to the Thebarton Fire Station and various works have been enjoyed, and Talks on scientific and engineering topics have been given by Mr. E. S. H. Gibson. Lantern Slide Shows have been given and a Rocket Car demonstrated. Mr. Gibson has left the school, thus bringing to an end many years' devoted service as Leader of the Club. *Secretary:* A. Wallace, Thebarton Boys' Technical School, South Australia.

## BRANCH NEWS

PERSE SCHOOL (CAMBRIDGE)—At a Social Evening Mr. Ramsbottom, the retiring President, was presented with the Merit Medallion and a farewell gift. Mr. D. Smith is now Chairman of the Branch. A Party was the most successful yet held. *Secretary:* J. Ady, 37, Boston Road, Cambridge.

STROUD—Great activity continues both on the Branch layout and in other directions. A Library has been added and a Discussion Group formed. In a Football Match between the two sections, the "Eagles" beat the "Kestrels" by 6 goals to 2. *Secretary:* D. Hargest, 6, Folly Lane, Stroud.

NORBURY—Varied activities have been pursued in this Branch, which is associated with the Norbury M.C. Visits have been paid to the Science Museum and the Imperial War Museum. *Secretary:* P. A. Knight, 17, Linden Avenue, Thornton Heath.

# Among the Model-Builders

By "Spanner"

**Clifford E. Lloyd, Liverpool 16, who was a successful competitor in a recent "M.M." model-building contest.**

## ROTARY MECHANISM FOR A ROUNDABOUT

The mechanism shown in Fig. 1 is intended for use in a model roundabout, and is suggested by Mr. L. J. Fowler, Ruddington.

The mechanism enables a central structure, carrying roundabout chairs, horses, and planes, etc., to revolve inside the main superstructure. At the same time the chairs revolve about their own axes, while the horses, or any desired alternatives, can be given an up and down motion.

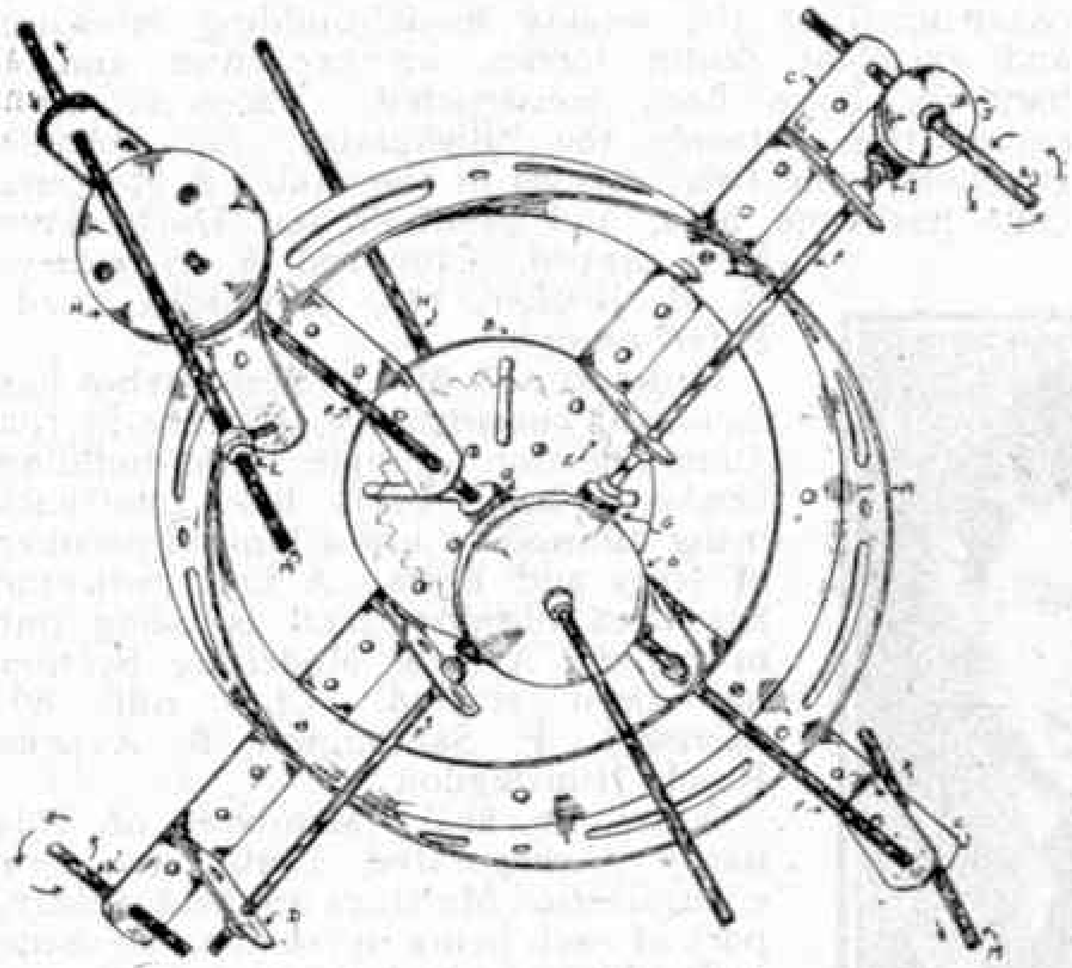


**Fig. 1. A diagram of the roundabout operating mechanism described on this page.**

The mechanism illustrated is made to fit a circular superstructure consisting of four 12½" Braced Girders, bolted together and overlapping two holes each. If more parts are available, however, the same idea can be extended to include a double circle of chairs, horses, etc., or even two circles revolving in opposite directions.

The top of the revolving central structure carrying the mechanism is built up from a Circular Girder A and a Face Plate B fixed centrally by means of four 4½" Strips C. Located between the under sides of these Strips and the Circular Girders are four 2½" × 1" Double Angle Strips D. Washers bolted between the Face Plate and the inner ends of the 4½" Strips compensate for the thickness of the Double Angle Strips.

A 2" Sprocket Wheel E, which is shown dotted in the illustration, is bolted to the upper side of the Face Plate and is spaced from it by four sets of two ½" loose Pulleys so as to allow clearance for the Chain.

In the outer holes of the Double Angle Strips D are mounted 4" Axle Rods F, which carry ½" Pinions G. On the outer ends of two of the opposite Rods Triple-Throw Eccentrics H are mounted, while the outer ends of the other pair of Rods F carry ½" Pinions. These Pinions engage with ¾" Contrate Wheels mounted on vertical Rods K, which are journalled at their upper ends in the outer holes of a pair of the Strips C and at their lower ends in the base of the revolving structure. These Rods carry the revolving chairs. The arms of the Eccentrics H mounted on the other pair of Rods F are loosely attached by ¾" Bolts to Collars L fixed by these same Bolts to vertical Rods M, which carry the horses, etc., and are journalled at their upper and lower ends in a similar manner to the Rods K.

An 11½" Rod N is secured to the top and base of the outer superstructure of the roundabout. This Rod passes through the Face Plate B and Sprocket Wheel E and carries a 1½" Contrate Wheel O that engages the four Pinions G.

The Sprocket Wheel is driven by a chain from the Motor and rotates the Circular Girder A. The Pinions G are rotated about the fixed Contrate Wheel O; and, through the Pinions I and Contrate Wheels J, impart a revolving movement to the pair of vertical Rods K carrying the chairs, and through the Eccentrics H a vertical reciprocating motion to the other pair of Rods M. Simultaneously the entire central structure revolves about the Rod N inside the outer superstructure.

## HOW TO USE MECCANO PARTS—(GIRDERS)

Girders play a very important part in Meccano engineering. They give rigidity to any structure in which they are incorporated, and the holes in them serve splendidly as bearings for Rods. Under the term Girders are included Angle Girders, Flat Girders and Braced Girders.

The Angle Girders differ only in their lengths. Each is perforated with round holes in one flange and elongated holes in the other. The object of the elongated holes is to provide the "play" that sometimes is necessary when bolting a Girder to other parts. The value of this play is illustrated in Figs. 2 and 4, which represent sections of two Angle Girders that are bolted together to form channel-

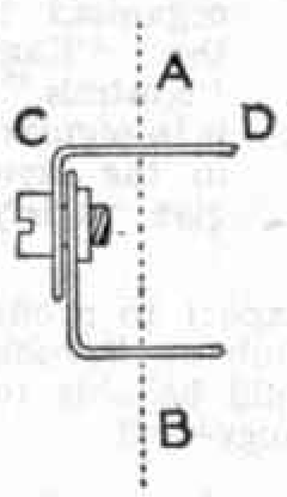



Fig. 2.

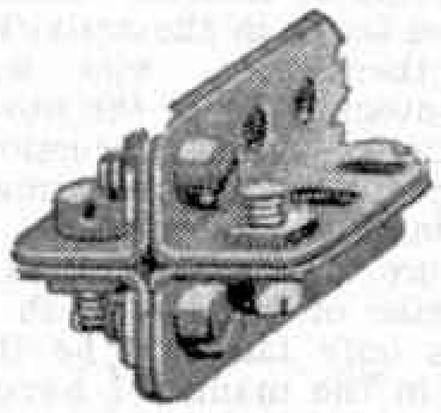


Fig. 3.

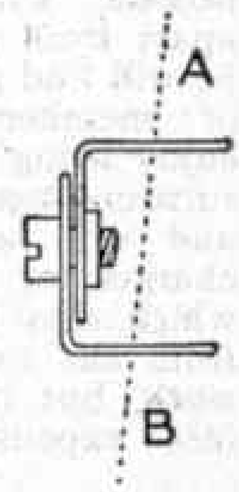



Fig. 4.

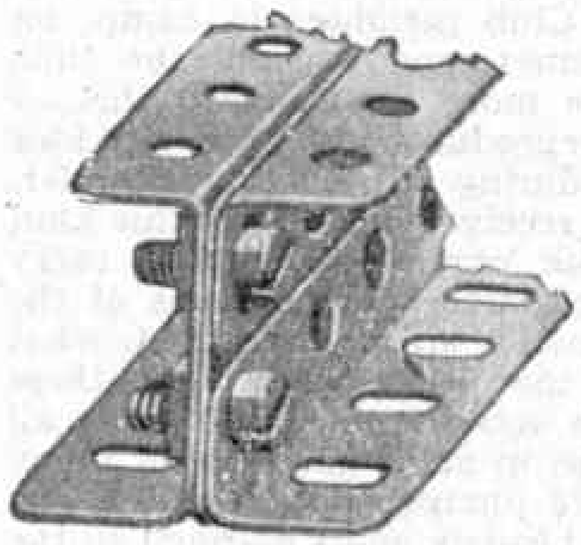


Fig. 5.

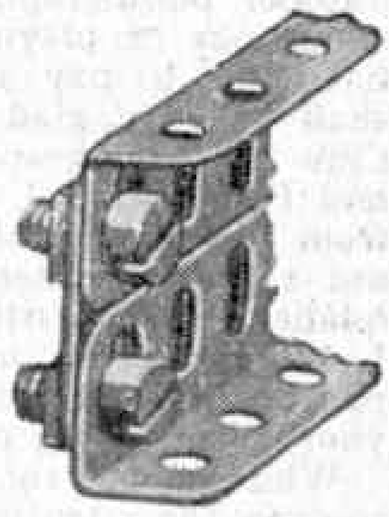


Fig. 6.

**These illustrations show various forms of girders built up from Meccano Angle Girders.**

section girders, Fig. 2 showing the right method of securing the Girders, and Fig. 4 the wrong method. In the former the narrow flange of one Girder is bolted to the broad flange of the other, with the result that the centres of the holes in the remaining flanges are exactly opposite, a feature that is important when it is desired to journal a Rod through the flanges of a built-up channel girder of this type.

Whenever a Rod is to be journalled through the wide flange of an Angle Girder, a short Strip should be bolted to the flange so that the Rod can pass through it as well as through the elongated hole.

Angle Girders lend themselves readily to the construction of the many different types of girders used in actual constructional engineering practice. Fig. 5 shows a built-up I-section Girder, consisting of four Angle Girders bolted to a Flat Girder. A built-up Channel Girder can be made as shown in Fig. 6 from two Angle Girders connected together by Flat Girders or by Fishplates. Fig. 3 illustrates a further example of a built-up Girder that is capable of withstanding tremendous bending or compressive stresses.

Braced Girders are not only useful in building large structures, but are also ornamental. They consist, in effect, of two parallel strips placed so that the opposite holes are 1½" between centres, and connected together by a series of diagonal ties and struts. When connecting two Braced Girders together by overlapping, they should, wherever possible, be overlapped an odd number of holes, so that the diagonals coincide. If they overlap an even number of holes the diagonals of one girder appear between those of the other, and the result is untidy and not so realistic.

Flat Girders are used principally in connection with Angle Girders in building up large girders. Examples of their uses in this connection are seen in Figs. 5 and 6. When the elongated holes of these parts are used for carrying the securing bolts. Washers should be placed under the bolt heads. If this is not done, and the bolt is screwed up very tight, the head of the bolt is liable to force the metal of the girder outward and thus become loose.

## A THREE SPEED AND REVERSE GEAR-BOX

The compact gear-box shown in Figs. 7 and 8 will be found suitable for most model vehicles. It provides ratios of 3:1 in first and reverse gears, 2:1 in second and 1:1 in third or top gear.

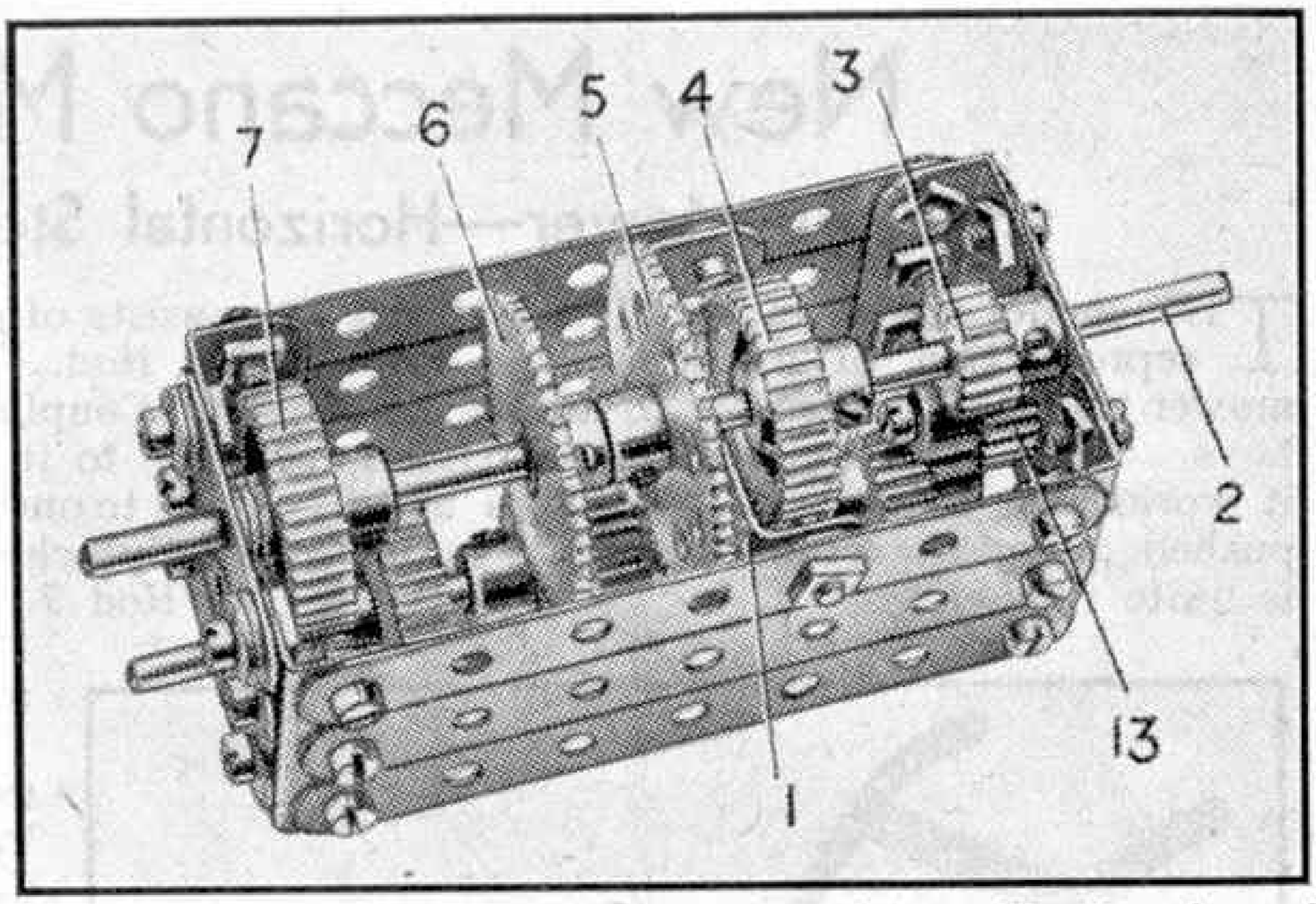



**Fig. 7. A general view of a useful gear-box which provides three forward speeds and a reverse drive.**

Each side of the housing consists of three 3½" Strips bolted at each end to a 1½" Angle Girder. The sides are joined by six 1½" Strips attached to the slotted holes of the Angle Girders, and a centre bearing is provided by a 1½" × ½" Double Angle Strip 1. It should be noted that a Washer is placed on each of the holding bolts between the Double Angle Strip and the side of the housing.

The input or primary shaft consists of a 3½" Rod 2, mounted in the end of the housing and in the centre hole of the Double Angle Strip 1. This Rod carries a ½" Pinion 3 and a 1" Gear. The Rod 2 projects slightly beyond the Gear 4, and into part of the boss of a 57-teeth Gear 5, which is fixed on the output shaft. This shaft carries also a 50-teeth Gear 6 and a 1" Gear 7, which is spaced from the end of the housing by three Washers.

The layshaft consists of a 4½" Rod, and it carries a ½" Pinion 8, a 1" Gear 9, a second ½" Pinion 10, a ¾" Pinion 11 and a 1" Gear 12. These Gears are arranged as shown in Fig. 8, so that the layshaft is free to slide about ¾" in its bearings. Reverse gear is obtained through a ½" Pinion 13, which is free to turn on a ¾" Bolt fixed to the end of the housing by two nuts.

Top gear is provided by sliding the layshaft to the extreme left (Fig. 8), the drive being taken through the 1" Gears 4, 9, 12 and 7. Second gear is obtained by moving the layshaft slightly to the right, so that the ¾" Pinion 11, is brought into mesh with the 50-teeth Gear 6. First Gear is obtained by meshing the ½" Pinion 10 with the 57-teeth Gear 5. Reverse Gear is brought into operation by sliding the layshaft to the extreme right, so that the Pinion 3 meshes with the reverse Pinion 13.

The position of the Gears and Pinions on the layshaft should be carefully adjusted so that a brief neutral period is obtained between each gear position. Movement of the layshaft can be controlled by a lever suitably mounted on the gear-box housing, and fitted with a Threaded Pin engaging between Collars fixed on the shaft. The Bolt holding the lever should be fitted with a Compression Spring.

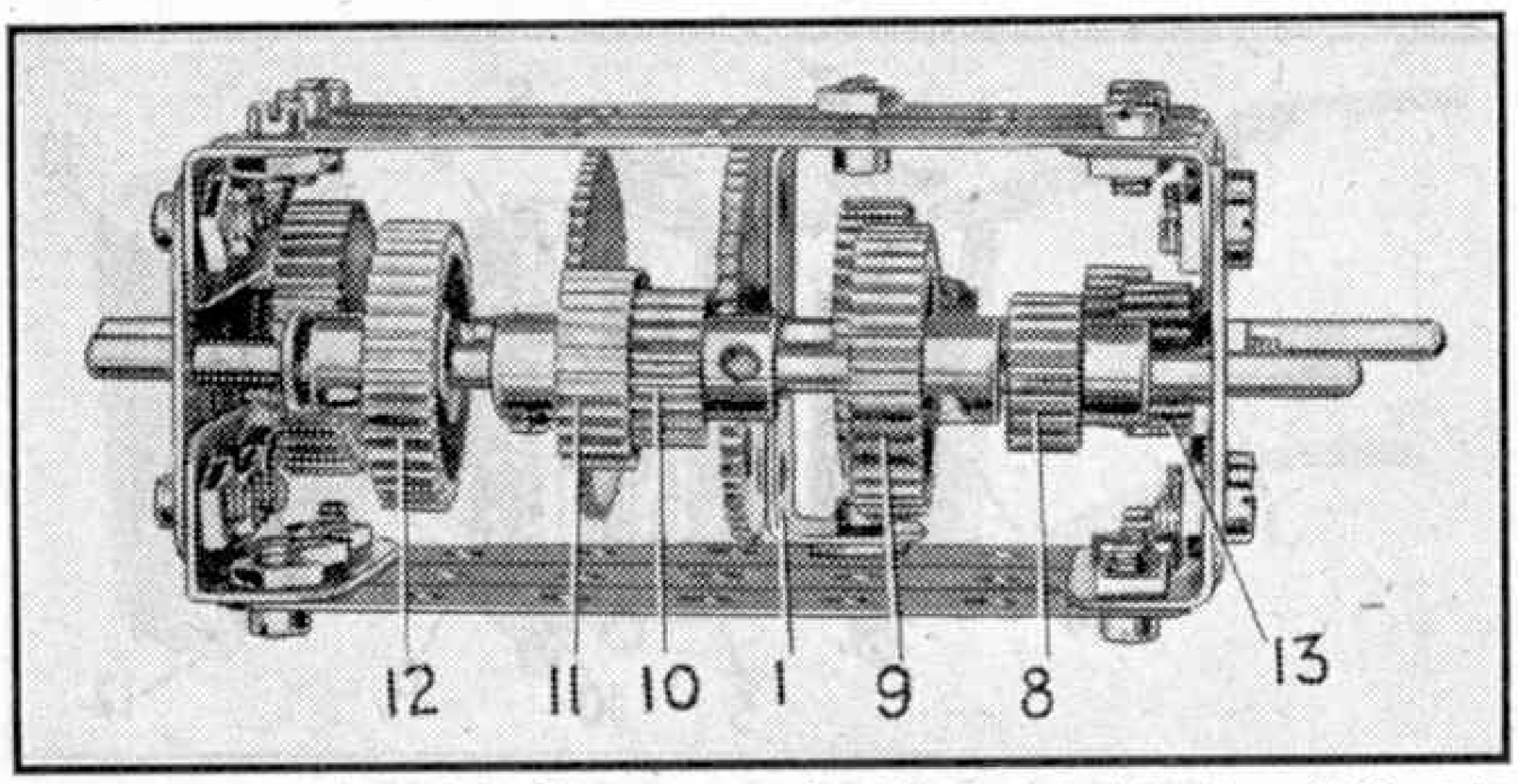



**Fig. 8. Another view of the Meccano gear-box illustrated at the top of this page.**

# New Meccano Models

## Lawn Mower—Horizontal Steam Engine

THE model shown in Fig. 1 is a simple reproduction of a roller type lawn mower that will be familiar to all Meccano boys. While it is quite simple to build, it works just like the real machine when pushed along the ground, and its action is quite realistic.

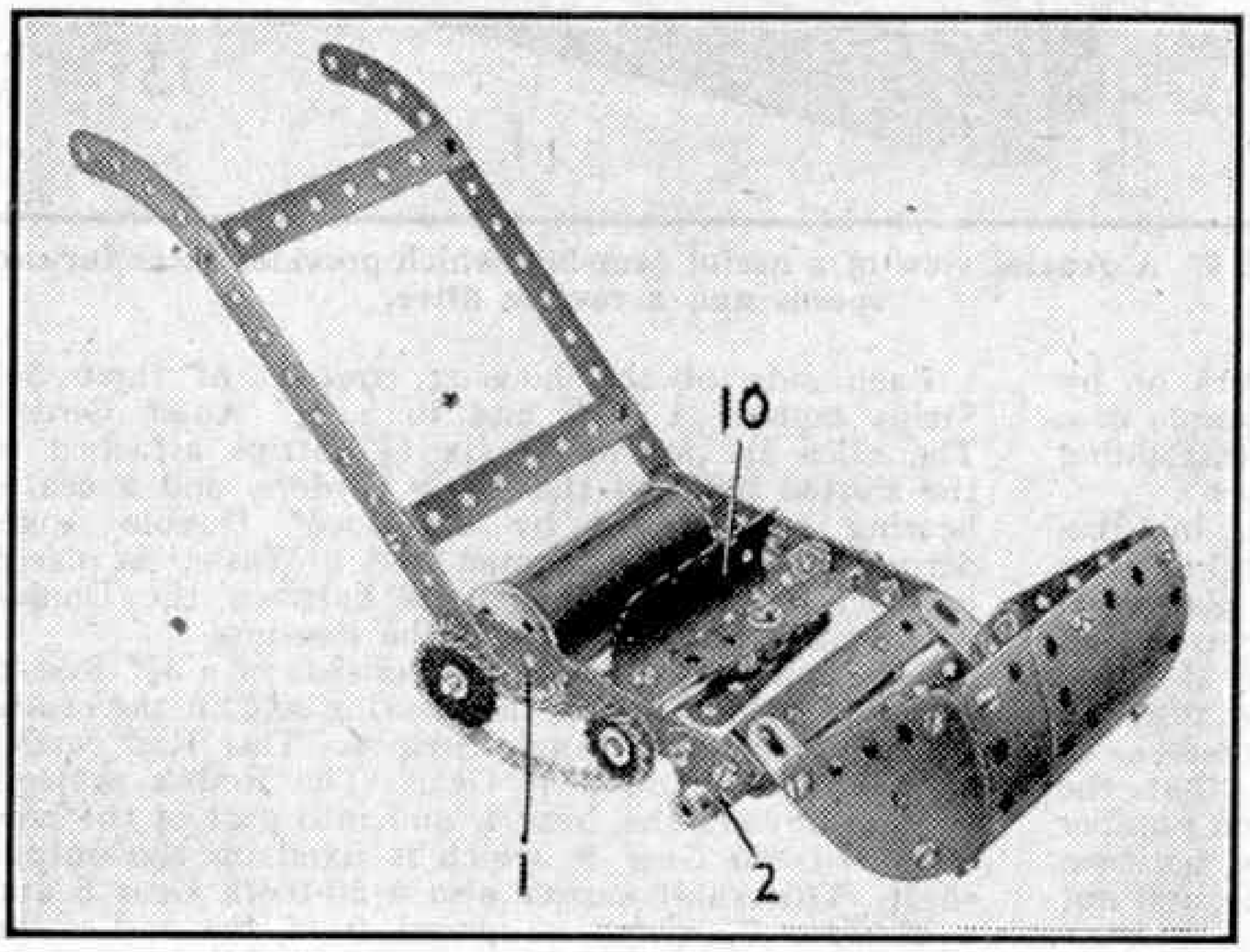



**Fig. 1. A realistic Lawn Mower built from Meccano.**

It is best to commence construction by building up the framework. Each side of this consists of two 2½″ Strips 1 overlapped two holes and bolted together. To the rear ends of this compound strip a 5½″ Strip is attached at an angle as shown, and this Strip is extended by a 2½″ Curved Strip to form a handle. A 1″ Triangular Plate 2 is bolted to the front ends of the compound strip. The two sides of the frame are connected together by four 3½″ × ½″ Double Angle Strips 3, 4, 5 and 6 (Fig. 2). A 4½″ Rod 7 that is journalled in the frame carries the roller, which consists of a 2½″ Cylinder fitted at each end with a 1⅛″ Flanged Wheel. The Flanged Wheels are fixed to the Rod, which also carries, outside the frame, a 1″ Sprocket.

The cutting cylinder consists of a Coupling 8 fixed to a second 4½″ Rod. Two 2½″ Strips are bolted to the Coupling and arranged at a slight angle to it as shown. A ¾″ Sprocket 9 is fixed to one end of the Rod and is connected by Sprocket Chain with the 1″ Sprocket on Rod 7. The grass plate is a 2½″ × 1½″ Flexible Plate, which is bolted to the Double Angle Strip 5.

The front roller consists of two Couplings and three ½″ loose Pulleys, held in place by Collars on a Rod 10.

The grass box is formed from two 4½″ × 2½″ Flexible Plates overlapped three holes along their long sides, and attached by Angle Brackets to two Semi-Circular Plates that form the ends of the box. The free edges of the Plates are strengthened by means of two 3½″ Strips, one of which is seen at 11, Fig. 2.

The grass box is attached to the Double Angle Strip 6 by means of two pairs of Fishplates 12, which grip the Double Angle Strip securely.

### Steam Engine

The simple model of a steam engine illustrated in Fig. 3 can be built with only a few parts, and can be set in motion by a *Magic* Motor.

The bed for the engine is made by connecting together the ends of two 12½″ Angle Girders by 4½″ Angle Girders. The 12½″ Angle Girders are also connected in the centre and at one end by 4½″ × 2½″

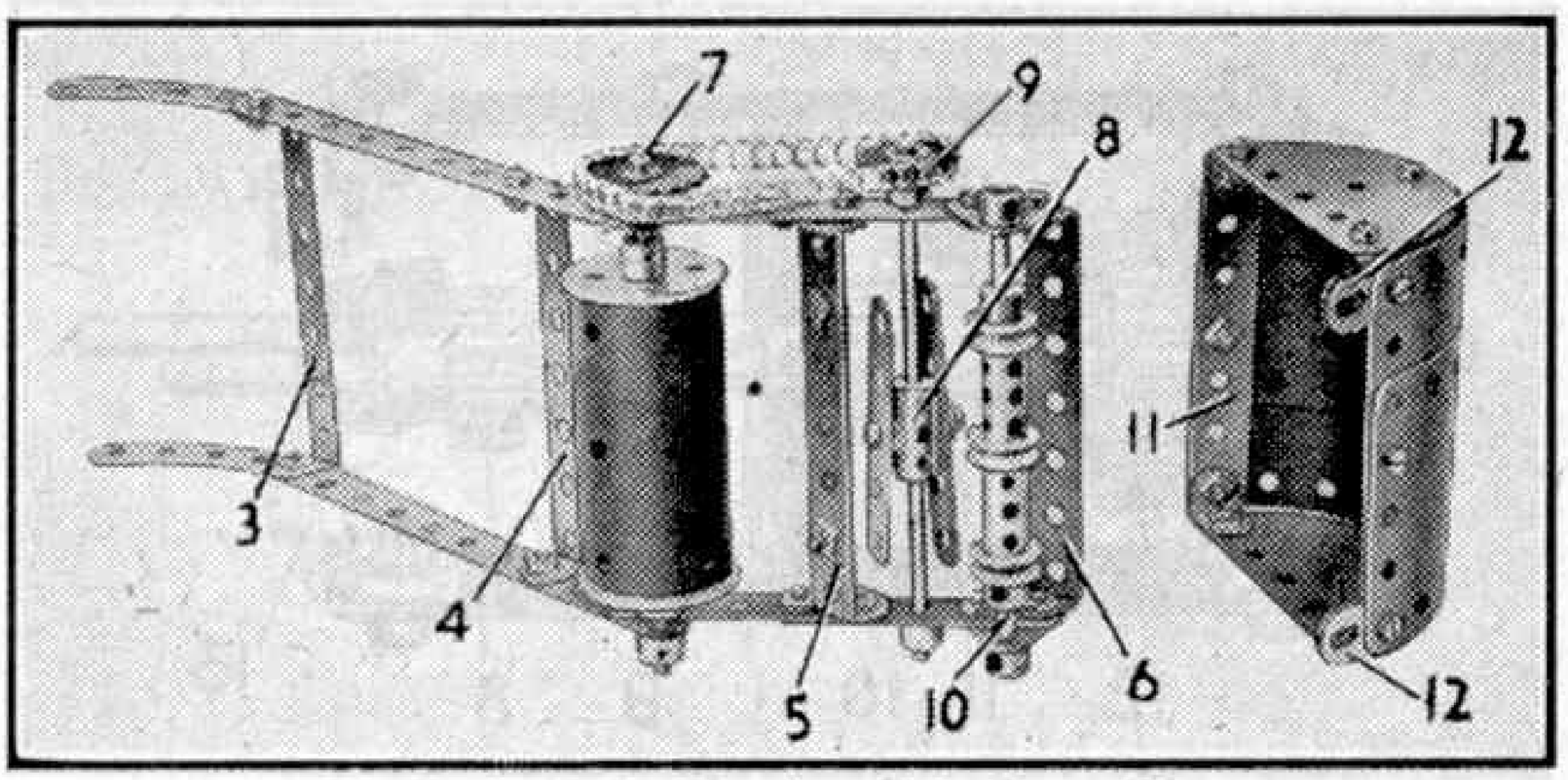



**Fig. 2. An underside view of the Lawn Mower.**

Flat Plates. A third 12½″ Angle Girder 1 is bolted in position in the centre of the base.

The cylinder is represented by a 2½″ Cylinder fitted at each end with a 1⅛″ Flanged Wheel. It is supported by two 1⅛″ Bolts. Each of these is passed through the Cylinder and a Coupling, and is fixed by a nut to the Angle Girder 1. Two Washers are used for spacing purposes between each Coupling and the Angle Girder.

Bearings for the crankshaft are provided on one side by a Flanged Bracket bolted to the base, and on the other by a Corner Gusset fixed to the Angle Girder 1. The Corner Gusset is spaced from the Angle Girder by eight 2½″ Strips and is attached by ½″ Bolts.

A 2″ Rod is passed through the Flanged Bracket, and is fitted with a fly-wheel made by bolting a Face Plate to each side of a Wheel Flange. A 1½″ Pulley is fixed to the outer end of this Rod, and it carries at its inner end a Coupling 2. A 1½″ Rod is passed through the Corner Gusset and carries a Bush Wheel and a Coupling 3. The Couplings 2 and 3 are connected by a 1″ Rod fitted with a Collar 4, which is freely pivoted on the Rod.

The connecting rod is formed by a 3″ Screwed Rod, which is partially screwed into a tapped hole in the Collar 4 and held in place by a nut. The other end of the Screwed Rod is fixed in a Swivel Bearing held on the piston rod, which consists of a 4″ Rod. This is passed into the cylinder, and it is supported by a crosshead formed by a 1½″×½″ Double Angle Strip 5. The Double Angle Strip is bolted to a Double Bent Strip attached to a 4½″ Angle Girder 6. The Angle Girder 6 is fixed to a second 4½″ Angle Girder bolted to the base.

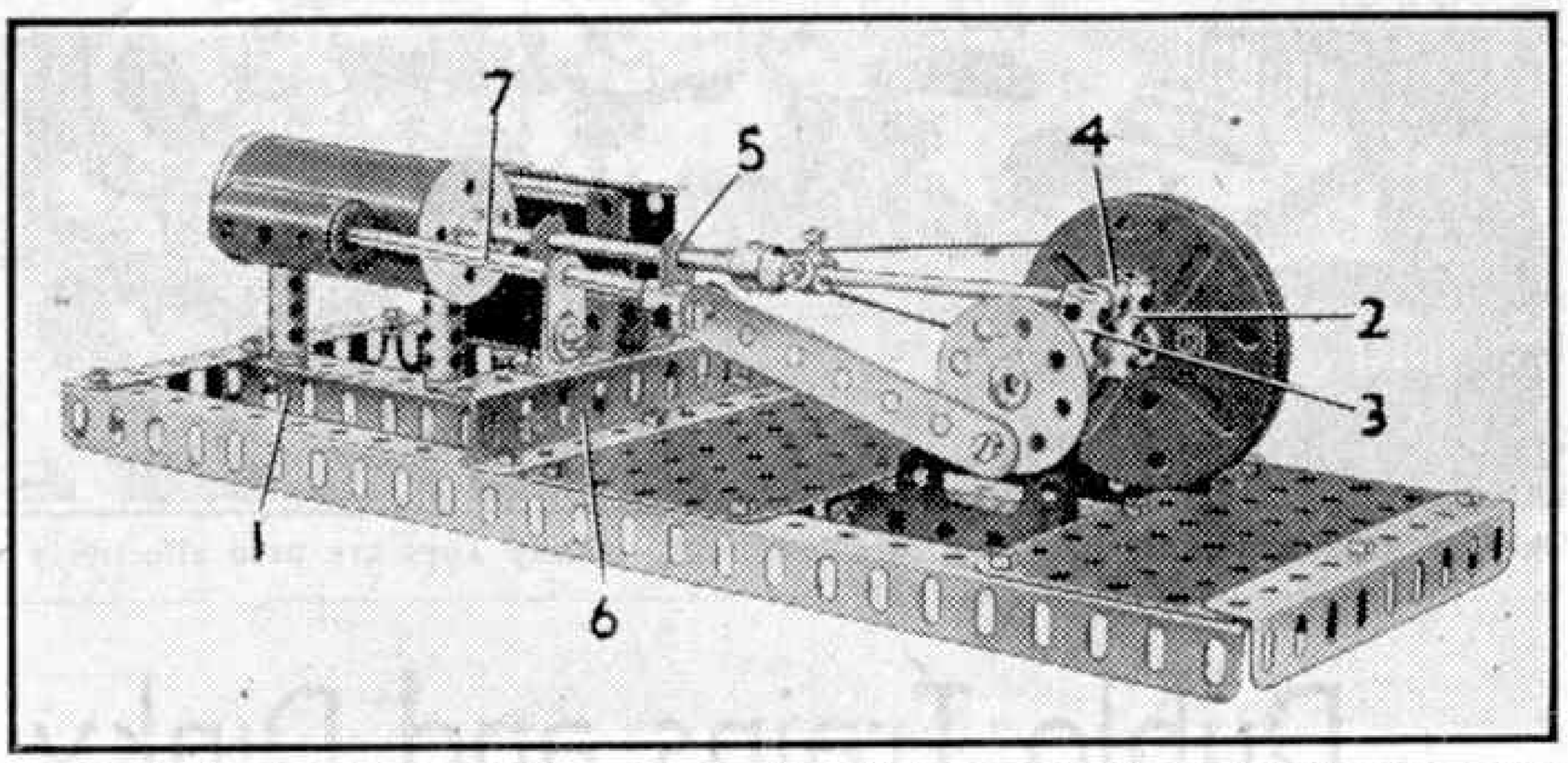



**Fig. 3. A simple Horizontal Steam Engine in which some novel constructional features are shown.**

The valve mechanism is made by lock-nutting a 3½″ Strip to the Bush Wheel fixed on the crankshaft. The opposite end of this Strip is attached by lock-nuts to a Rod and Strip Connector fitted to a 4½″ Rod 7. This Rod is passed through a Chimney Adaptor fitted to a Sleeve Piece. The Sleeve Piece is bolted to the 2½″ Cylinder. The Rod 7 is supported by a 1″×½″ Angle Bracket bolted to the Angle Girder 6. A Fishplate fixed to the 1″×½″ Angle Bracket is used to prevent Rod 7 from sliding in the slotted hole.

A *Magic* Motor is bolted to the base as shown and it is connected by a Driving Band to the 1½″ Pulley on the crankshaft.

## Prizes for Models of All Kinds

Readers are reminded that there is still time to send in entries for the "General" Model-Building Competition announced in last month's "*M.M.*" In this competition prizes are offered for the best models of any kind built entirely from Meccano parts. All models submitted must be original, that is, they must not be copies of models that appear in Meccano Instruction Books and other publications, and they must be the competitor's own handiwork. Any number of parts may be used in building models.

The competition will be divided into two Sections: (A) for readers of all ages living in the British Isles; (B) for readers of all ages living Overseas.

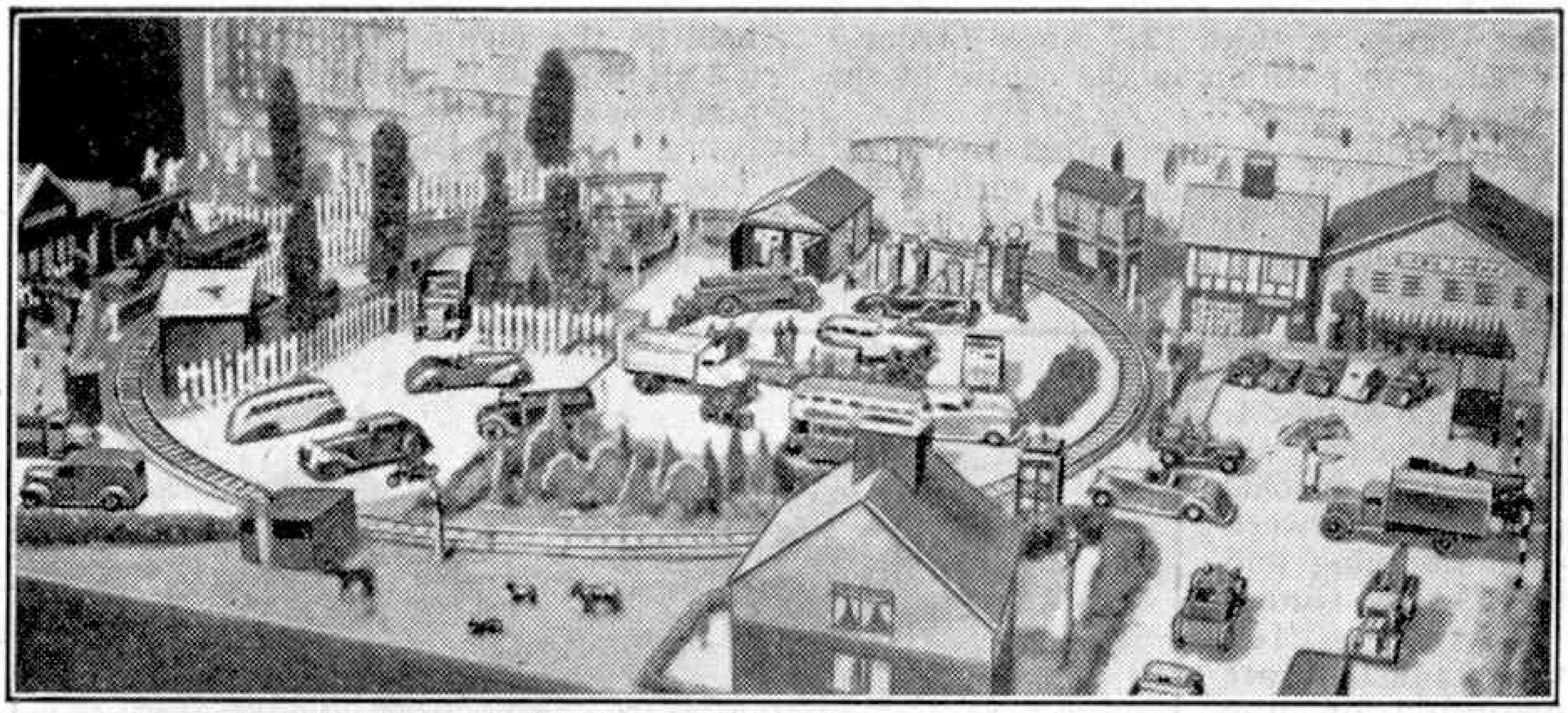
When the model is completed a photograph or a good sketch of it should be sent to "*April General Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13.*" The competitor's age, name and address must be written on the back of each photograph or drawing submitted, together with the name of the competition and letter A or B indicating the Section for which the entry is eligible. Actual models must not be sent.

Prizes will be awarded in each Section of the competition as follows: First, Cheque for £2/2/–; Second, Cheque for £1/1/–; Third, Postal Order for 10/6. There will also be a number of consolation awards and Certificates of Merit. Readers living in the British Isles must forward their entries before 31st May. The closing date for Section B is 31st July next.

### "SIMPLICITY" MODEL-BUILDING CONTEST RESULTS (HOME)

1st Prize, Cheque for £2/2/–: E. A. Stevens, Banstead; 2nd, Cheque for £1/1/–: D. Barrie, London N.20; 3rd, Postal Order for 10/6d.; K. J. Magor, Newton Abbot.

Consolation prizes of 5/–: G. Cawston, Hunstanton; A. D. Bartram, London S.W.14; P. D. Hancock, Edinburgh 9; J. W. Leslie, Kirkcaldy; B. W. Saywell, Forest Fields; M. Davies, Fishersgate.



**The scenic layout of R. Kitching, Middlesbrough. Dinky Toys are used effectively with a simple Dublo track.**

# Dublo Trains and Dinky Toys

THE use of Meccano Dinky Toys on miniature railway layouts has been dealt with on various occasions in these pages. There are probably few layouts that do not include one or two Dinky Toys, at least as part of the lineside equipment. These realistic little vehicles and other models add a great deal to the life and bustle that should be represented round and about the miniature railway system.

Some care is necessary in selecting the Dinky Toys that are best fitted for use with a Dublo layout. The smallest Dinky Toys Cars are really the most suitable, such as No. 35a Saloon Car, 35b Racer, 35c M.G. Sports Car and 35d Austin Seven Car. These look well either waiting outside the station or simply forming part of the general road traffic.

Road transport for passengers is provided by means of the No. 29b Streamlined Bus or No. 29c Double Deck Bus. Both are most effective, the double decker being specially suitable for "Town" use.

No. 22c Motor Truck is a good representative of commercial vehicles and it is quite effective for coal or general traffic.

All these smaller vehicles can be used on any part of the system. If any of the larger types are included they should preferably be kept away from the trains. Thus such items as No. 25d Petrol Tank Wagon, No. 33w Mechanical Horse and Open Wagon or No. 34b Royal Mail Van, all closely associated with railway activities, can appear as part of the general traffic.

A scenic layout on which effective use is made of Dinky Toys components is that of R. Kitching, Middlesbrough, shown on this page; let him tell us about it in his own words.

"The rails and other items are fastened down on to a folding baseboard measuring 4 ft. 6 in. by 3 ft. The railway was first of all fenced in by Hornby Hedging and paled fencing, but not sufficient of this equipment was available. The method suggested in the *'M.M.'* was therefore adopted of putting matchsticks into the base at intervals and connecting these with fine wire.

"On one side of the station, which is placed on the outside of the circular track, is the station yard, and beyond it a sports field. On the other side there is the usual bus and tram station, the area being kept alive by Dinky Toys vehicles standing in the roadway.

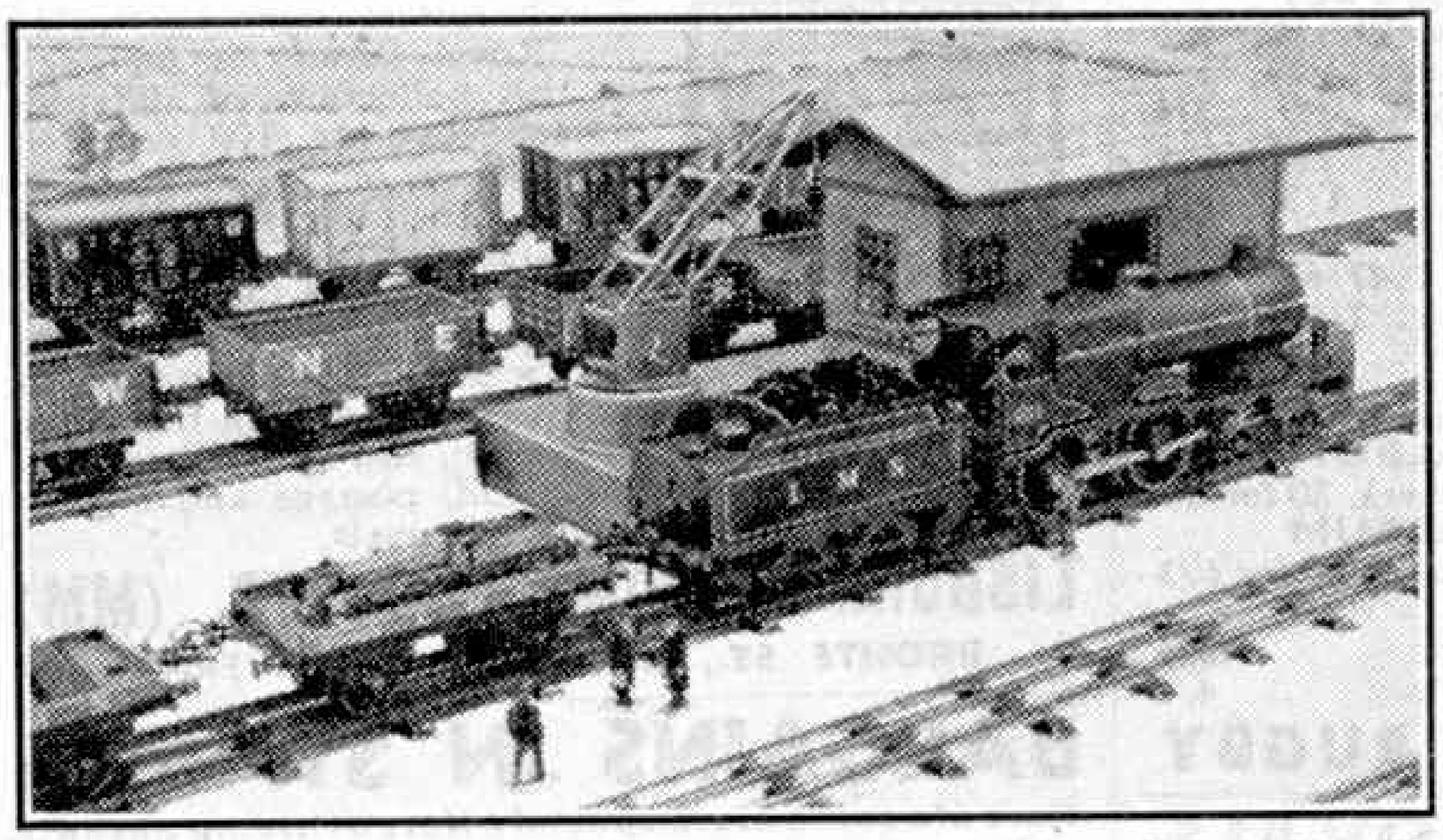
"Coming out of the station, at which two roads converge, the road crosses the railway at a level crossing and runs past an Army camp on one side, and a small wood on the other.

"Many of the buildings were bought recently in parts. The field surfaces and roads are painted in their appropriate colours and Hornby Trees add to the realism of the countryside.

"The smaller cars of the Dinky Toys series have been widely used and half a dozen of these are employed in the car park near the cinema. In all there are about 50 Dinky Toys vehicles in use."

# Varied Freights for Hornby Railways

THE loading of the wagons of a Hornby goods train is a fascinating business and no doubt most readers will have their own favourite schemes for producing realistic effects. These pages have frequently given hints for the loading of different materials, such as the well-known "false bottom" idea to save weight in loading open wagons.



**An unusual load. A really miniature locomotive is carried on the Flat Truck behind a Hornby L.M.S. Standard Compound.**

Beginners will perhaps like to know that this idea involves the making of a card shape, like a box lid, to fit inside the wagon body, and of such a height that it comes just below the top edges of the sides. The top of this "lid" is covered with glue and then sprinkled with small coal, coke, sand, small stones or whatever load is required. In fact it is not a bad idea to have a stock of these loads for different kinds of traffic. The enterprising Hornby railway owner will be able to devise several variations of this scheme.

In addition to loose loads carried in bulk, a vast amount of traffic carried in open wagons or covered vans consists of goods in drums, crates, cases or otherwise protected. To represent drums or similar items, small bottle corks, either painted or not, are quite successful, and they have the advantage of light weight. Crates or cases can be made by the handy boy from wood or card, and it is possible to do quite a lot with such things as match boxes and other small containers that are found about the house.

Unusual or special loads are interesting to handle. Some Dinky Toys make good loads, and other toys or models sometimes have possibilities. As an example, in the upper illustration the Hornby Flat Truck is carrying quite an unusual and interesting load. This consists of a miniature locomotive made up from one of the printed card kits available at most hobby shops. This little engine, compared with Hornby stock, represents very well a miniature passenger-hauling locomotive as used on several narrow-gauge lines in this country.

A load such as this will, of course, only be carried occasionally. A type of traffic that may be bulky and that is handled frequently is timber. Big tree butts can be represented very well by sawn pieces of dead wood from a small tree or stout bush. They can be carried on a Timber or Lumber Wagon for preference, or even on a Flat Truck. If no other vehicle is available the familiar Open Wagon can be put into service.

**A busy scene on a simple Hornby layout. The Goods Wagons are being shunted while a passenger train passes in the background.**

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*For other Stamp Advertisements see also pages 172 and vii.*

# Stamp Collecting

## Stamp Wars in the New World

By F. Riley, B.Sc.

RECENT events have drawn attention to the inclusion of maps in stamp designs. The number of map stamps is not very large, but many of them are of interest because of political reasons for their issue, and these have attracted special attention.

A stamp issued in the Central American Republic of Guatemala in 1939 is an excellent example. Not long ago there were violent demonstrations in the capital of this country against the British, who were accused of wrongly holding possession of the colony known as British Honduras, to which the Guatemalans give the name of Belize, that of the capital of the colony. The claim is based very largely on the position of Guatemala as one of the successors of Spain in the New World, and is not at all new, although it is only within the last few months that really great excitement has arisen as a result of it, as the Guatemala map stamp of 1939 shows.

The stamp is reproduced on this page. It bears the arms of the country and the price 5c. in side panels, and on the map in the centre British Honduras, which is not distinguished by that name, or indeed by any other, is tinted in exactly the same shade and colour as Guatemala itself, plainly indicating the belief that it is just a part of the country, and not rightly British at all. It is interesting to find that some years earlier a stamp of practically identical design was issued in which British Honduras, there given the name of Belize, was not included in Guatemalan territory.

There is some suggestion that a similar claim to British territory may be advanced by Venezuela, in South America, which borders on British Guiana. A claim was made to part of this British colony by Venezuela 52 years ago. At first this received some backing from the United States, but after arbitration Great Britain was confirmed in possession of her portion of the Guianas. While this arbitration was in progress Venezuela emphasised the claim by the issue of the map stamp of the disputed area reproduced on this page. Apparently that portion of British Guiana west of the River Essequibo was claimed, but the map is not very effective; it has a confused appearance, and is not nearly as well designed for its purposes as the Guatemalan stamp of 1939.

The issue of the stamp, to the tune of 4,000,000 examples, created some trouble for Venezuela, as not only Britain, but the United States also protested, and it was withdrawn. The remainders were still available for sale, however, and collectors should have no difficulty in finding copies. If Venezuela does press her claim again, there may be yet another political map stamp.

It is curious to find that most of these political map stamps come from South America. The Falkland Islands have been the centre of a map war for a considerable time. The beginning of this can be traced back to the centenary of this British colony in 1933, for the commemorative set then issued included a map of the Falkland Islands. There was probably no special purpose behind the production of this stamp, but this could not be said of an Argentine map stamp published three years later. The map shown on this stamp was that of the South American Continent, with Argentine territory specially tinted, and just to show that the Argentine Government thought the Falkland Islands ought to be their property these were tinted in exactly the same way as Argentine territory on the mainland.

The Argentine Republic has never admitted the right of the British to be in the Falkland Islands, and still pursues its claim on stamps. Its ambitions indeed have been expanded to include Antarctic lands lying to the south of the continent, the scene of the activities of many famous British explorers. These claims were made in a stamp issued last year and reproduced on page 377 of the September 1947 '*M.M.*,' which shows a wedge-shaped section marked in a special colour extending right to the South Pole itself. This was a reply to the appearance of a very interesting map stamp in the Falkland Islands a short time previously, which emphasised British claims to lands in this sector of the Antarctic, and to the issue of stamps of the Falkland Islands overprinted with the South Georgia, South Shetlands, South Orkneys and Graham Land dependencies of this British colony.

The sectors marked on these British and Argentine stamps overlap very considerably indeed, and just to complicate matters still further Chile joined in by issuing a large and clear map stamp as one way of establishing a claim to Antarctic lands. This was followed by a cruise of the Chilean navy, escorting the President of Chile himself on a visit to the region. The stamp is reproduced at the head of this page.

South America was the scene of a stamp war that was followed by actual fighting. A frontier dispute between Bolivia and Paraguay led each country to issue a stamp showing the disputed land as its own territory. Bolivia indeed issued four such stamps, and the Peace Conference that ended the war produced yet another map design, issued by Paraguay in 1939, showing the new frontiers.

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*For other Stamp Advertisements see also pages 170 and vii.*

# Stamp Gossip

## and Notes on New Issues

By F. E. Metcalfe

BY the time these words appear, the two British stamps issued to commemorate the King and Queen's Silver Jubilee will be on sale, and as things look at present the exchequer will have profited greatly by the sale of the £1 stamp. Whether hundreds of thousands have been sold, as was freely predicted by those who should have known better, will not be known yet, but the writer of these notes very much doubts if the optimistic forecasts will be realised. Without a doubt a few useful dollars will be forthcoming, however. It is to be hoped that the postal authorities will continue from time to time to commemorate worth while happenings by means of special stamps, but there should be no more stamps with a face value of more than a few coppers, otherwise collectors will soon get tired, as has happened already in the case of Belgium and other countries.

Meanwhile the rest of the world continues to produce attractive issues, and those we illustrate this month are a particularly choice lot. First of all we have the "Otago" set of New Zealand, beautifully printed in England by Messrs. Bradbury Wilkinson, and in fairly attractive colours. The designs nevertheless leave something to be desired, for they are, as is usual with modern New Zealand commemorative stamps, somewhat overloaded with detail. The 2d. value indeed has enough detail to supply the whole four stamps comprising the set, but such is the popularity of New Zealand stamps that dealers are still finding this set a best seller. By the way, the 2d. value of the New Zealand Peace issue is another stamp that should be included in the Princess Elizabeth collection suggested in the March "*M.M.*"

Austria has issued a stamp to commemorate the Olympic Games that from an artistic point of view is a real gem, and if we compare the design with that of the New Zealand stamp we see how simplicity pays. All modern Austrian stamps are beautiful, and one cannot wonder that India has gone to this country to get the Gandhi memorial set. It was mentioned in one of the stamp papers that British printers might have been given the chance to print the set. As a matter of fact, it is probable that British printers could not find time to do the work, if one is to judge by the time they take to produce the stamps they do undertake to produce. Some time ago we were solemnly informed that it took nine months to produce our own commemorative stamps. If it took such a period to produce the stamps we have to put up with, how many years would it take to get out stamps similar to the magnificent Austrian issues? There is no evidence that we could do it at all.

Italy is another country which has improved her stamps greatly since the war, and the latest set is something to be proud of. Four stamps have been issued in honour of the birth of St. Catherine of Siena, 600 years ago. Not only are the designs beautiful in themselves, but their appearance is greatly enhanced by the delicate colours that have been used. Altogether a lovely set, and fortunately one that collectors will be able to buy for a very few coppers.

Our fourth illustration shows a stamp issued recently by France in honour of Louis Braille, who perfected the system of reading and writing for the blind. All the world knows how that great man benefited mankind, and the posthumous honour now paid to him is not misplaced.

Mention has been made this month of the three Continental countries, Austria, France and Italy, and strangely enough the writer of these notes recently saw collections of the modern stamps of these countries. Altogether about £8 had been spent on them, and as the stamps had been nicely arranged, the result was delightful. It was hard to say which looked the best, for all three countries are producing beautiful stamps, and if there are any junior collectors who cannot afford to go in for our own modern colonials, they might do worse than collect post-war issues of these European countries. They have not the investment possibilities of our own KG VI issues, but they are far and away more beautiful. It is true that some of the colonial stamps of to-day are quite attractive, but they look very crude if placed alongside some of the stamps of Austria or France, or even Italy.

It is good news for collectors of King George VI stamps that Gibbons are not only bringing out a special catalogue for their group, but also it would seem, for a change, that there will be enough to go round. Gibbons state that a reliable catalogue was needed and that is an understatement, for the need has been a crying one for some years now, and it is to be hoped that the catalogue will be worthy of the cause. The probability is that it will be, for Gibbons move with good purpose when they do move. The catalogue will probably appear in August, in plenty of time for the new season, and King George VI stamps, already prime favourites all over the world, look like being in for a boom period.

There was a discussion recently as to which was the best KG VI bargain in Gibbons Part 1, and it was finally agreed that the 1/- value of South West Africa "Bantam" with large overprint held the palm. This stamp is priced at 6/- the pair.

# Competitions! Open To All Readers

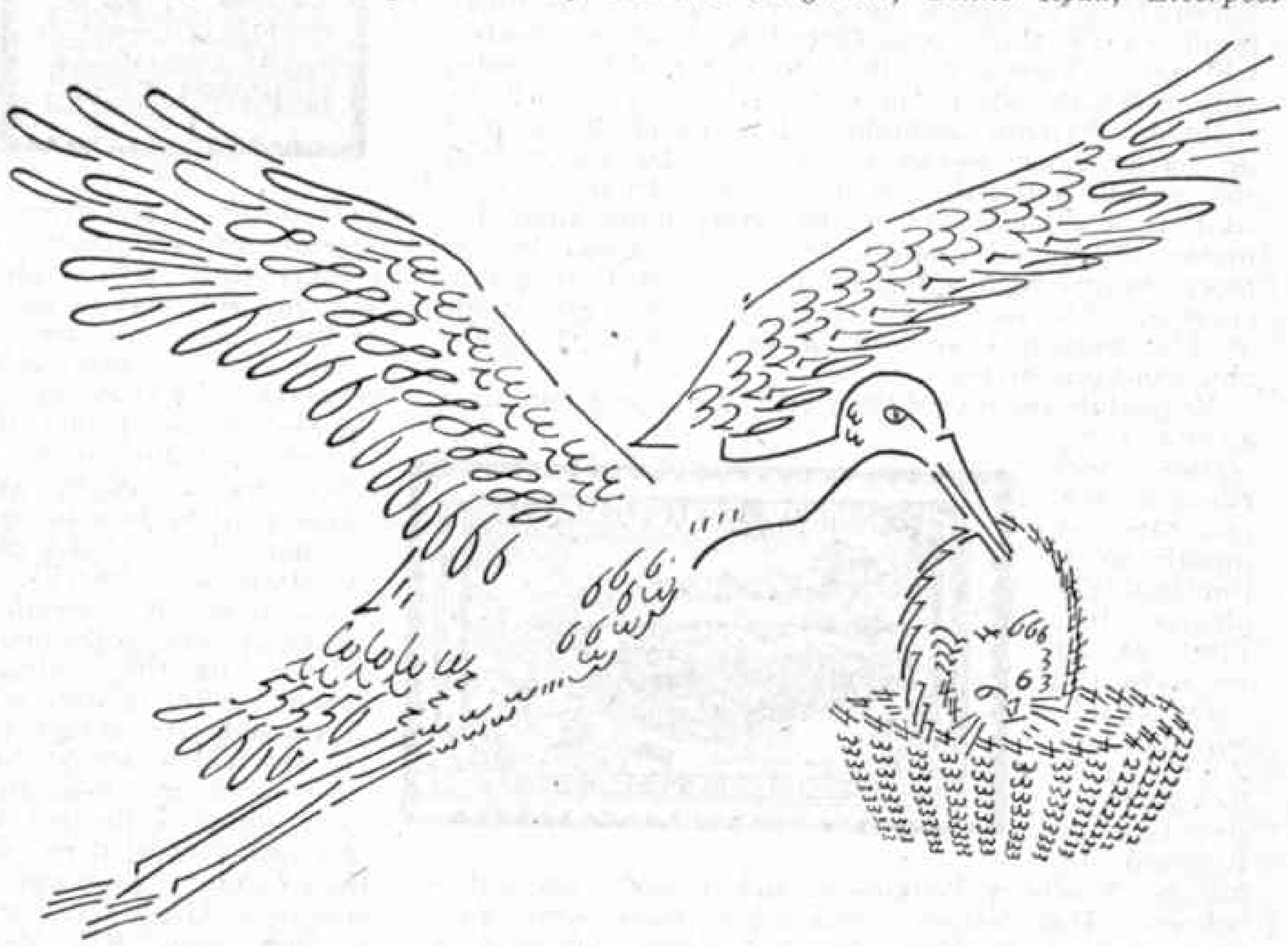
*Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.*

## Picture Numbers

What is the stork shown in our illustration bringing? We can accept the artist's assurance that the basket holds a cat, and on examining the drawing more closely we find that it appears to be made up of 3s and 4s, and the cat and the stork also are built up of figures.

In our competition this month readers are asked to find the total of the figures shown. Each is to be counted separately, only the figures 1 to 9 being employed, and there are no combinations of two, three or more figures. Some figures are upside down and others on their sides, while a few are stretched out or otherwise distorted. Distinguishing between the 6s and 9s offers no difficulty, as the rule is that the curl of a 9 is closed, while that of a 6 is open.

In each of the two sections, for Home and Overseas readers respectively, there will be prizes of 21/–, 15/– and 10/6 for the senders of the four nearest estimates to the correct total, in order of merit. There will also be Consolation Prizes for other good efforts, and in the event of a tie for any prize preference will be given to the entries showing the neatest or most novel presentation.



Solutions should be addressed *"Stork Figures Contest, Meccano Magazine, Binns Road, Liverpool 13."* The closing date in the Home Section, is 30th June, and that in the Overseas Section is 31st December.

## Which Trains are Hidden Here?

For our second competition this month we have a short story into which names of eight well-known trains have been introduced. Some of these names have been scattered, that is the words making them up appear at different places in the story. Competitors are asked to track down the eight names.

"John Reid spent a day recently in a Devon town. He had lunch at the Belle Hotel, a famous hostelry where he noticed the Royal Arms mounted above the door, while inside there was a picture of the Cornishman who had founded the Hotel nearly a century earlier.

"Although John is an Aberdonian he does not expect all his pleasures scot free, and after lunch he willingly paid for a seat at a matinee performance of a play 'The Queen of Scots.' In this there was much fighting, and he was surprised to see the bow and arrow in use as well as primitive fire arms. On leaving the theatre he walked through the fine park, in which there were many splendid oaks, sycamores, pines and horse chestnuts. Then he went to call on a friend who was the manager of the Golden Cinema, in Comet Street, and they had a good talk before it was time to make his way to the station. On the way there he bought an '*Express*' to read on the journey home."

In addition to the names of the trains competitors are asked to state their former owning companies, and the places between which they ran. Entries are to be forwarded to *"May Railway Contest, Meccano Magazine, Binns Road, Liverpool 13."* There will be the usual two sections, for Home and Overseas readers, and in each there will be prizes of 21/–, 15/– and 10/6, with Consolation Prizes for other deserving efforts. Neatness and novelty will be taken into account by the judges in the event of a tie. Closing dates: Home Section, 30th June; Overseas Section, 31st December.

## May Photographic Contest

This is the fifth of our 1948 series, and for our subject this month we take the countryside, photographs of landscapes and woodland scenes, or those including country cottages, barns or farmhouses being typical. It is not necessary to include country people or animals, but their presence is not excluded. Apart from this there are only two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of the print must be stated exactly what the photograph represents. A fancy title may be added if desired.

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16. They should be addressed *"May Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13."* There will be separate sections for Overseas readers, and in each section prizes of 21/–, 15/– and 10/6 will be awarded. Closing dates: Home Section, 31st May; Overseas Section, 30th November.

# Competition Results and Solutions

## HOME

### OCTOBER 1947 CROSSWORD

1st Prize: T. Hill, Bolton. 2nd Prize: G. M. Salmon, Ross-on-Wye. 3rd Prize: J. K. Tunstall, Bolton. Consolation Prizes: R. Taylor, Sheffield 11; R. M. Lambert, Uppingham; A. Young, Kilmacolm.

### OCTOBER 1947 RAILWAY ERRORS

1st Prize: F. Mills, Kearsley. 2nd Prize: J. L. Makin, Derby. 3rd Prize: C. E. Wrayford, Bovey Tracey. Consolation Prizes: N. Thompson, Brooklands; A. Riches, Surbiton; M. D. Jones, Stafford; D. B. Appleyard, East Ardsley.

### NOVEMBER 1947 DRAWING CONTEST

1st Prize: T. Berry, Liverpool 15. 2nd Prize: A. Baker, Nottingham. 3rd Prize: P. D. Hancock, Edinburgh 9. Consolation Prizes: P. W. Harper, Swindon; P. Green, Knutsford; J. Rose, London S.E.27; K. Dales, Lincoln.

### NOVEMBER 1947 LOCOMOTIVE PUZZLE

1st Prize: B. H. Carter, Shipley. 2nd Prize: R. T. Smith, Stockport. 3rd Prize: P. J. Lucas, Southport. Consolation Prizes: G. E. Hamilton, Woodbridge; J. Birch, Elmesthorpe; C. H. Rainford, Buxton.

### NOVEMBER 1947 PHOTOGRAPHIC CONTEST

1st Prize, Section A: R. R. Bushell, Hoddesdon; Section B: G. R. Brown, Hove 4. 2nd Prize, Section A: H. Barber, New Houghton; Section B: C. H. Thomas, Aldershot. 3rd Prize, Section A: R. Wrigley, Clitheroe; Section B: A. J. Caines, Eastcote. Consolation Prizes, Section A: A. W. Bull, West Bridgford; A. C. Bloomfield, Poynton; J. F. Gordon, Nr. Elgin; A. E. Loosley, Brighton. Section B: D. A. Cheater, Romford; M. Balding, Bradford; A. Degiorgio, London N.14.

### DECEMBER 1947 ADVERTISEMENT LETTER SQUARE

1st Prize: A. R. G. Burrows, Bournemouth. 2nd Prize: D. B. Appleyard, East Ardsley. 3rd Prize: J. R. LeMare, Wakerley Manor, Nr. Oakham. Consolation Prizes: S. Moore, Portsmouth; R. Flower, Sidcup; R. E. Venables, Liverpool 5.

### DECEMBER 1947 RAILWAY CONTEST

1st Prize: T. Hill, Bolton. 2nd Prize: K. F. Howell, London S.E.25. 3rd Prize: N. S. Raine, Newcastle-on-Tyne 3. Consolation Prizes: P. Turner, Rhyl; T. Moody, Bristol; R. B. Thurman, New Barnet.

### DECEMBER 1947 PHOTOGRAPHIC CONTEST

1st Prize, Section A: S. L. Connors, New Malden; Section B: S. Sebba, London N.20. 2nd Prize, Section A: P. W. Lang, Sevenoaks; Section B: B. H. Carter, Shipley. 3rd Prize, Section A: N. V. Salt, Newcastle; Section B: W. S. Kyle, Leighton Buzzard. Consolation Prizes, Section A: E. Whitaker, Liverpool 22; P. F. Chapman, St. Leonards-on-Sea; C. E. Wrayford, Bovey Tracey; J. E. Martin, Fishguard; S. S. Pethybridge, Newton Abbot. Section B: A. Johnstone, Cardenden; J. Bodman, Dundee; Miss G. Joseph, Camberley; P. R. Cook, London S.E.25.

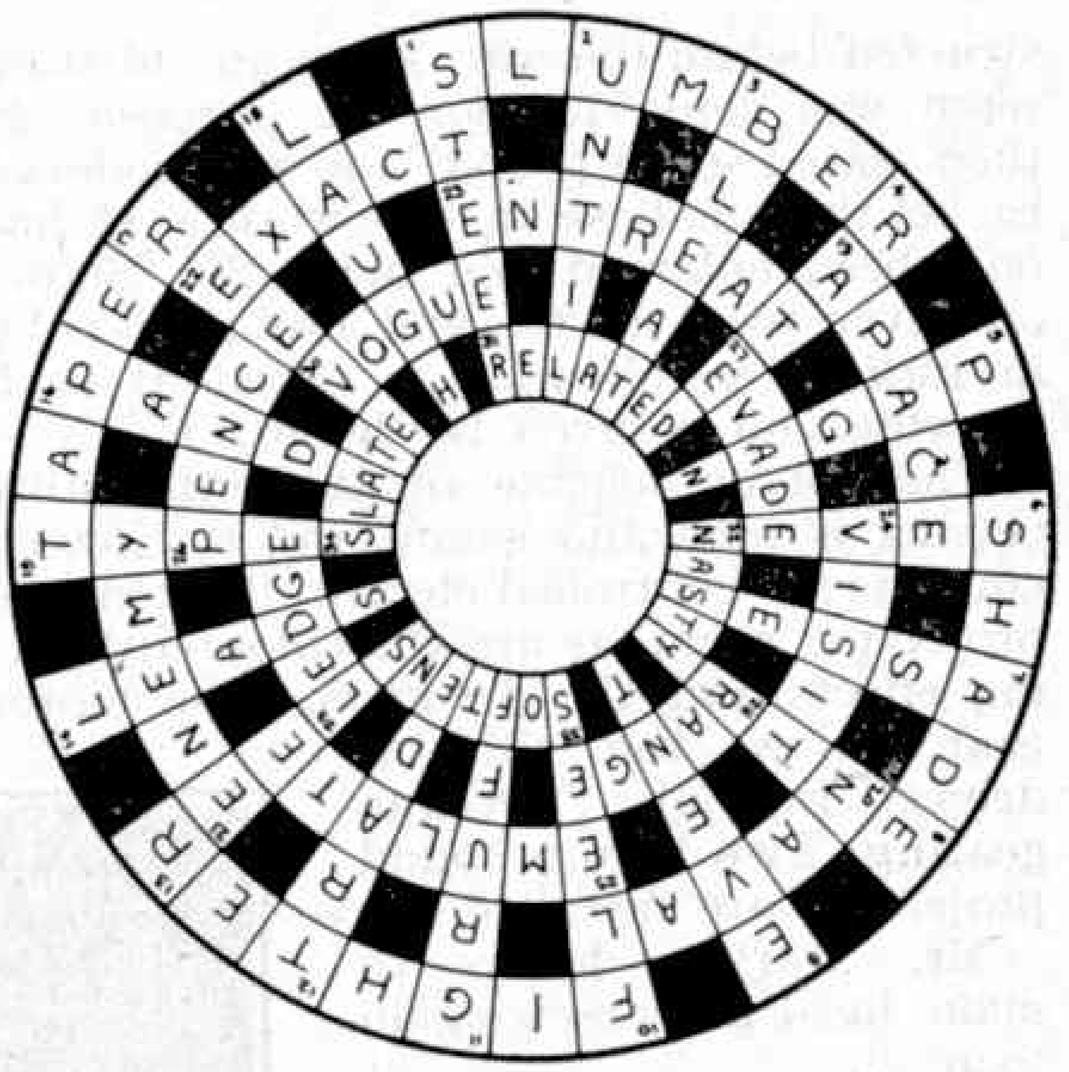
### JANUARY 1948 COVER VOTING CONTEST

1st Prize: G. White, Bournemouth. 2nd Prize: M. V. Chattle, Kingston. 3rd Prize: A. Mallard, Croydon. Consolation Prizes: A. C. Parsons, Sheffield 8; I. Allan, Auchtermuchty; V. Wood, Rhondda.

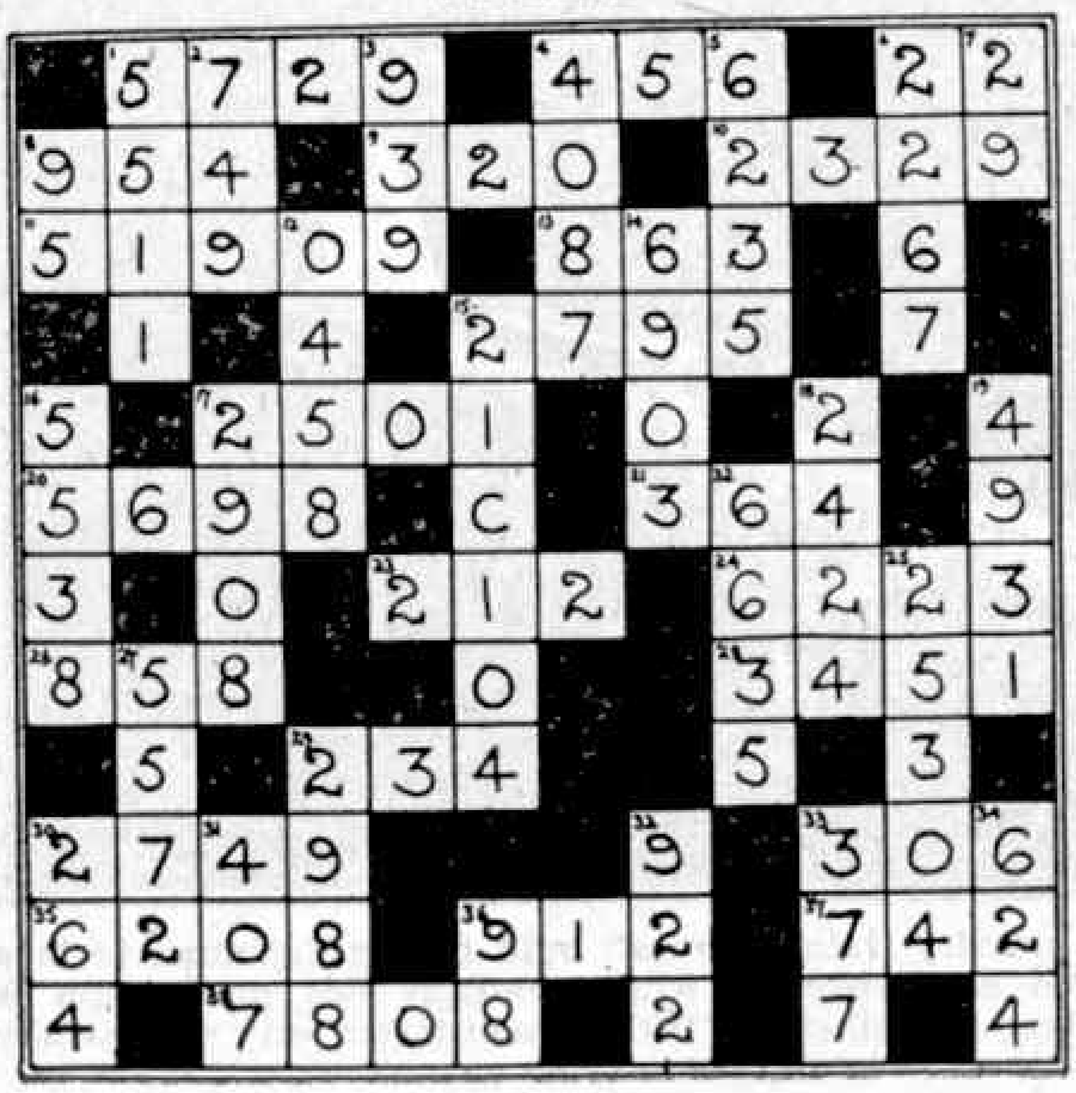
## OVERSEAS

### MARCH 1947 CIRCLEWORD CONTEST

1st Prize: L. H. Brittain, Onehunga, N.Z. 2nd Prize: A. J. H. Smith, Kimberley, S.A. 3rd Prize: Mrs. E. Stonyer, Meadowbank, Australia. Consolation Prize: D. J. White, Christchurch, N.Z.



### APRIL 1947 LOCOMOTIVE "CROSS-NUMBER" PUZZLE



### MARCH 1947 WAGONS CONTEST.

1st Prize: J. Balmer, Cape Town, S.A. 2nd Prize: R. Davies, Ismailia, Egypt. 3rd Prize: S. B. Hook, Hamilton, N.Z. Consolation Prize: I. T. G. Johnstone, Wellington C.1, N.Z.

### MARCH 1947 PHOTOGRAPHIC CONTEST

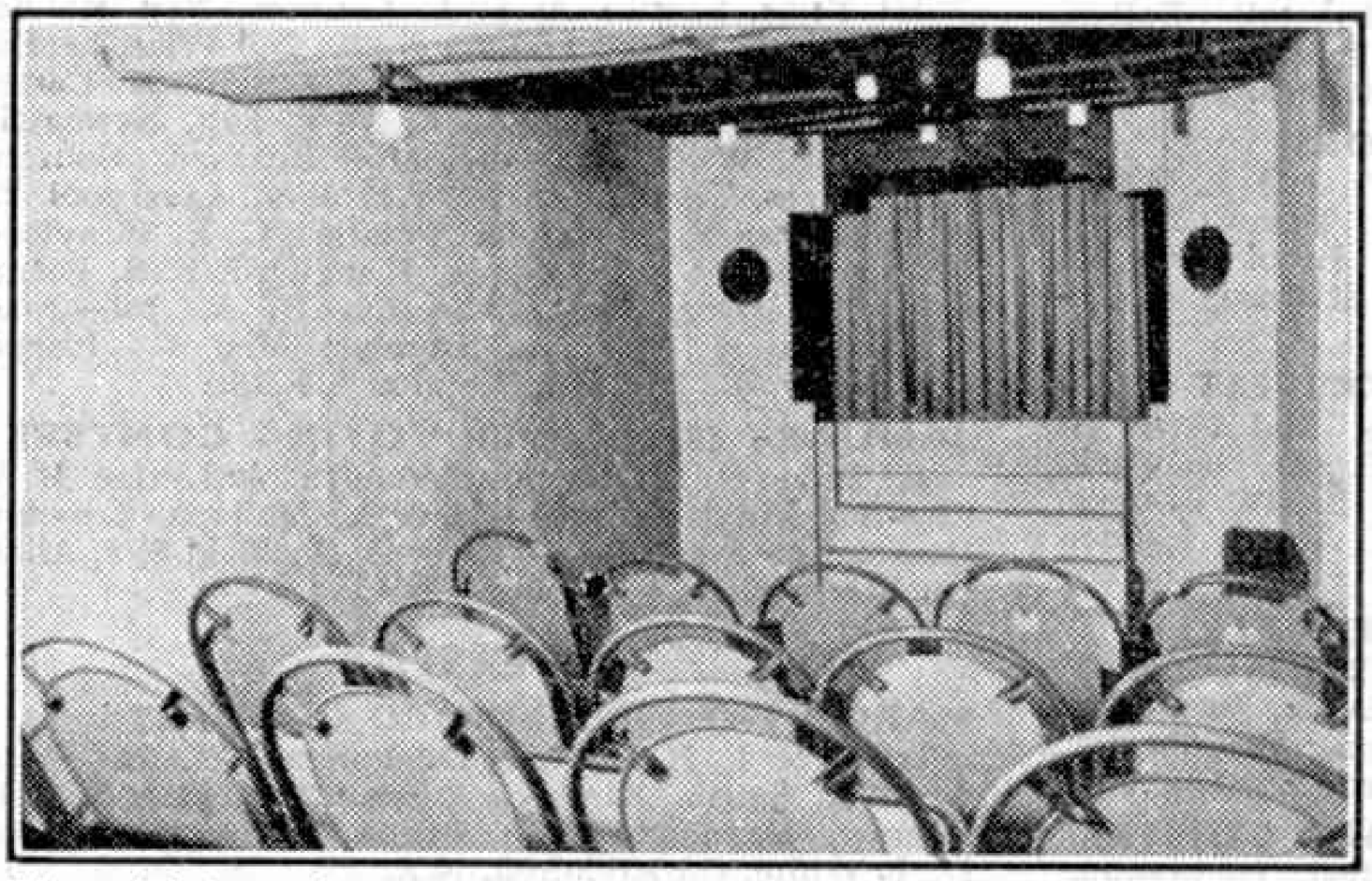
1st Prize, Section A: Miss P. N. Milne, Hawke's Bay, N.Z.; Section B: W. McGowan, Lagos, Nigeria. 2nd Prize, Section A: P. Nuttall, Cape Town, S.A.; Section B: N. A. Macdougall, Victoria, Canada. Consolation Prizes: E. Hohls, Natal, S.A.; J. M. Demanuele, Malta, G.C.

### APRIL 1947 LOCOMOTIVE "CROSS-NUMBER" PUZZLE

1st Prize: J. Vernon, St. George, Canada. 2nd Prize: B. Molton, Cape Town, S.A. 3rd Prize: J. Munroe, Sydney, Australia. Consolation Prize: D. J. White, Christchurch, N.Z.

## A Miniature Cinema

The upper illustration on this page shows a tiny cinema owned by Mr. G. M. Starling, Meccano and Hornby Train dealer, of Dereham, Norfolk. The cinema was constructed before the war, when an old store room was converted for the purpose. It then seated seven people, and was believed to be the smallest in the world. It has now been enlarged and holds 20. Shows are given twice a week and admission is by invitation; a collection is taken at each showing and is given to the R.S.P.C.A.



**The miniature cinema owned by Mr. G. M. Starling, Dereham, Norfolk, by whose courtesy this photograph is reproduced.**

The colour scheme of this interesting cinema is pink and green, and the screen curtains are controlled electrically from the projection room, as are the coloured lighting effects and the dimmers. The motor that moves the curtains drives through Meccano gearing. Two 16 mm. sound projectors are installed.

Mr. Starling hopes to make local news reels again soon.

### A MODEL RAILWAY EXHIBITION

Readers living in Edinburgh and District will be interested in a model railway exhibition arranged by Mr. E. Dove, Nottingham, that will be held at Leith Links from 22nd to 27th May. The working models to be shown include a 10¼ in. gauge reproduction of the "*Coronation Scot*," a model G.W.R. "Hall" of the same gauge and many others of the greatest interest, all of which have been built by Mr. Dove. The proceeds of the Exhibition are being devoted to the work of the Soldiers, Sailors and Airmen's Families Association.

**Oil for Britain**—(*Continued from page 160*)

conjunction with *aromatics*. In addition, countless most important organic substances are synthesized from aromatics alone, the chief of which are perhaps the "coal tar" dyestuffs. The aromatics have been derived hitherto mainly from coal tar, but a new process of great significance has now been developed which will produce from Kerosene, Gas oil or other distillates, a full range of both aromatics and olefines in one operation. This operation is termed the "Catarole" process (for the CATalytic production of AROmatics and OLEfines) and a plant to operate it is at present under construction at Partington near Manchester. Details of this process will in due course form the subject of a special article in the "*M.M.*"

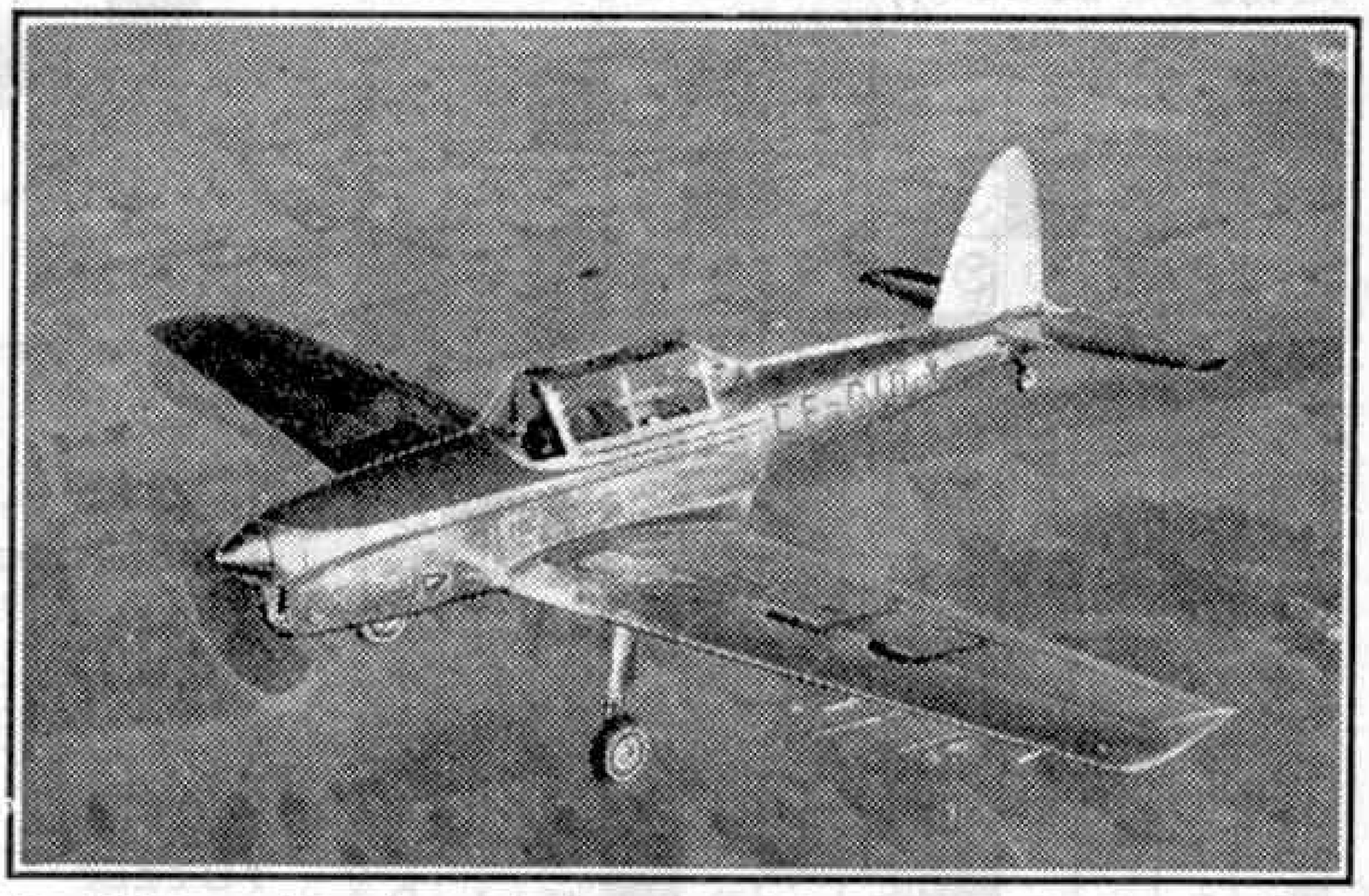
The last two illustrations in the present article are reproduced by courtesy of Manchester Oil Refinery Ltd.

* * * *

In these four brief articles, an effort has been made to present the reader with an overall picture of the petroleum industry as it stands to-day, with special emphasis upon oil refining in Britain. The industry is continually expanding and, as has been shown, there is almost no aspect of modern living which does not depend on it. Ambitious young chemists and engineers will find enormous and exciting possibilities in the World of Petroleum.

**Helicopters at Work**—(*Continued from page 147*)

Gander. Nor does it tell of the skill and gentle precision needed to land a helicopter on a platform with only 18 in. of room to spare, carrying a passenger with a broken neck. Only when such details are filled in can the real value of a helicopter rescue service be appreciated. As the Editor of "*The New York Times*" wrote: "The helicopter, fragile child of air science, did the trick that nothing else could accomplish. The ingenuity of man has seldom won a quicker or more thrilling victory over the wilderness."



**The "Chipmunk" primary trainer aircraft built by the Canadian factory of the de Havilland Enterprise, by whose courtesy this photograph is reproduced. This type of trainer has been demonstrated very successfully in this country.**

# Fireside Fun

"Your teacher tells me you have been absent from school several times recently. What's the idea?"
"Class hatred, father."

* * * *

"Sorry to see you've got a black eye, Albert."
"You'll be sorrier still for your Jimmy. He's got two."

* * * *

"My father made a scarecrow that frightened every bird away for miles around our farm."
"That's nothing. My father made one that scared them so much they brought back all the corn they stole before he put it up."

* * * *

"Have you an excuse for being so late?"
"Not yet. I stopped outside for half an hour trying to think of one."

* * * *

"That man does spring cleaning all the year round."
"That sounds funny."
"It's quite right. He's a watch repairer."

* * * *

"Do you work long hours at your place?"
"No. They all have the usual 60 minutes."

* * * *

"Now Harry, if you had 10 apples and Tom took some away, leaving you four, what would Tom have?"
"A black eye, Miss."

* * * *

### THIS MONTH'S HOWLER

The Elizabethan era was a mistake of Queen Elizabeth.

* * * *

"Do specs really save your eyes?"
"Rather. They've just kept those two big fellows from hitting me."

### BRAIN TEASERS

### CONSCIENCE MONEY

Tommy Green went to his newsagent to buy his favourite weekly comic. The newsagent was busy at the back of the shop, and while waiting for him Tommy picked up a shilling that was lying on the counter. He paid for his comic with this, receiving 10d. change. On his way home he realised that he had done wrong and went back to put things right. How much did he owe the newsagent?

* * * *

### FLYING THOUGHTS

Can you identify the birds indicated by the following clues: 1, A war worker; 2, A famous outlaw's name; 3, A disease; 4, Peddle; 5, Cotton fabric. . K.J.B.

* * * *

### BITS AND PIECES

I am a name of 10 letters. My 8, 9, 10 is good to eat, but scarce now; my 1, 2, 6 is used for rubbish; and my 7, 5, 6 is a trap that some people would recognise as a spirit. My 3, 2, 4 puts an edge on things, and my whole is a famous city. Can you put me together? B.I.N.

* * * *

### YOU START THIS

Here is another word pyramid, built up by starting with one letter and adding a single letter at a time, re-arranging the letters to form the words indicated by the following clues. 1, A vowel; 2, A metal has lost its head; 3, Relations; 4, Connection; 5, Compare; 6, Another metal; 7, Crease; 8, Formed in fire-boxes. S.W.C.

* * * *

"Do these belong to the ranunculus family?"
"No, sir. They belong to the Council."

* * * *

### SOLUTIONS TO LAST MONTH'S PUZZLES

In 20 minutes the first train travels 20 miles and each of the trains from the opposite end of the line 13⅓ miles. Thus the latter trains are strung out at 33⅓ mile intervals, and their successive starting times must be 50 min. apart.

In our second puzzle only 1945 for SNOW fits the conditions. This makes X 3, so that the age required now is 56. SAND is 1892.

The code used in our third puzzle last month was a very simple one. The hidden message is read by taking only the last letters of each section and is MECCANO IS THE BEST HOBBY.

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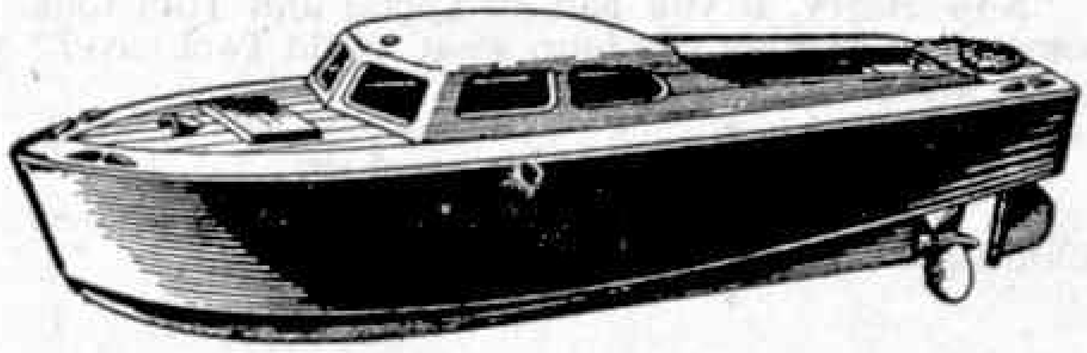

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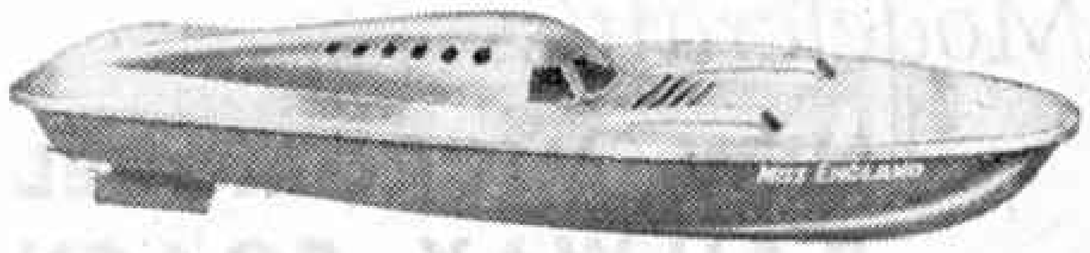

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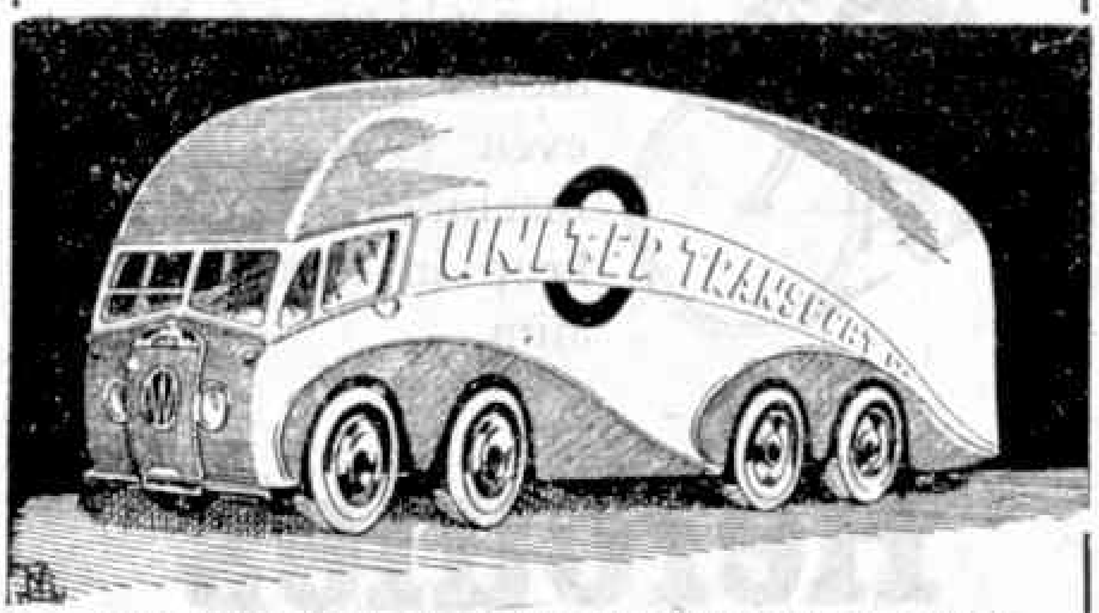

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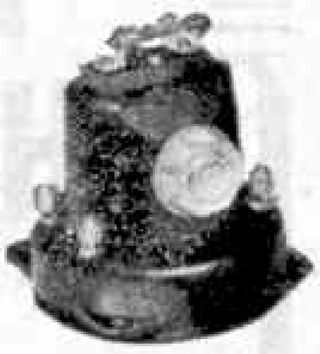

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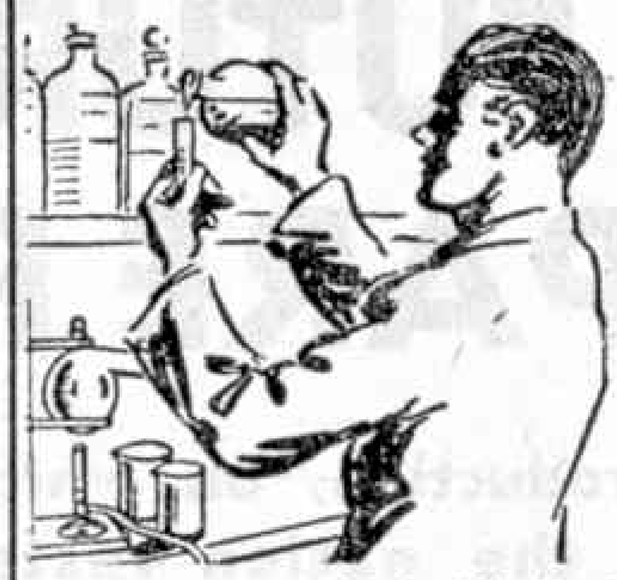

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# READERS' SALES AND WANTS

## SALES

"Aeroplane," All 1943–1947 in half yearly volumes; "Air Force," July 1946–October 1947; "M.M.," 1942–1946 in yearly volumes; "Navy," April–December 1941, June 1946–January 1948; "A.T.C. Gazette," October 1943–January 1946; "Sea Cadet," February 1944–June 1945, December 1945–February 1946; 38 "Flights," 1943–1945; "Aeroplane" and "Flight" minus advert. pages. Good condition. Offers to—White, "Highfields," Kirkby Road, Sutton-in-Ashfield, Nottingham.

Hornby Gauge 0 Electric Railway. Consisting of 12 Curved, 22 Straights, Six Points, Two Half and One Quarter Rails; without joinings Nine Curved and 17 Straights; also 30 odd damaged Rails and One Point; Wayside Station, Signal Box, Small Cutting, Small Bridge (not roadway), Level Crossings, Engine Shed (slightly damaged), Three Signals (one Double), Two Buffers; L.M.S. Passenger Engine (not working very well), Tender, Turntable (clockwork), 18 Clips for Rails, Corridor Coach, 17 Rolling Stock. Also Transformer and Controller. In good condition. The whole £15/10/- or nearest offer.—Slatter, 14, Queen's Road, Evesham, Worcs.

300 "Champions," "Wizards," "Hotspurs," and "Rovers." What offers.—H. R. Simpson, 38, Wycombe Road, Birmingham 28.

Maerklin Gauge 00 Electric Train Set. Comprising 4–6–4 Streamlined Tender Locomotive, approx. 30 ft. of Track, Electrically Operated Points, Rolling Stock, Electric Yard Lamps, Transformer and Controller. Perfect condition, practically unused; £16.—Pritchard, 117, Bewdley Road, Stourport-on-Severn, Worcs.

Electric Motor. Price 30/-, post 4d.—R. K. Jefferies, 30, Leamington Road, Southall, Middlesex.

77 numbers "Meccano Magazine" 1937–1944, good condition; offers for whole only.—G. Allen, 163, Boston Manor Road, Brentford, Middlesex.

MECCANO MAGAZINE

*Registered at the G.P.O., London, for transmission by Canadian Magazine Post.*

**EDITORIAL AND ADVERTISING OFFICES:**
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

**Readers' Sales and Wants.** Private advertisements (i.e., not trade) are charged 1d. per word, minimum 1/-. Cash with order. Readers' advertisements are published as soon as possible; inclusion in the first issue after receiving them cannot be guaranteed.

Magazines, Books, Comics, etc., s.a.e. for list to—H. Robson, 9, Webster Crescent, Currock, Carlisle, Cumberland.

1,000 Cigarette Cards in Sets or singly; 50 Postage Stamps, Coronation and Jubilee.—J. L. Leeson, 74, Mill Lane, Brigg, Lincs.

"Meccano Magazines" in good condition; Jan. 1940–June 1941, December 1942–December 1947 (Sept. and Nov. 1945, and Dec. 1946 missing). Offers to—D. Swan, Newbrough, Fourstones, Northumberland.

"Meccano Magazines," July 1939–April 1945 (Oct. 1939, Feb. 1941, July 1941 and May 1942 missing; Dec. 1940 torn). What offers?—Box No. M.M.20.

Over 400 Minibrix and Accessories, £3; Diana 177 Airgun, 25/-; Dynamo Lighting Set, 25/-; *Magic Motor*, 3/-; Large Binoculars, 10/-; Earphones, 10/-; over 20 Dinky Toy Ships, 10/-; Hornby Gauge 0 Electric Train and Accessories; send for lists to—Johnson, Sunnyhill House, Bruton, Somerset.

World-wide Collection of Postmarks offered in small lots. Particulars, send stamped addressed envelope—Forster, 31, Spennithorne Avenue, Leeds 6.

Trix Rails; Cigarette Cards; Minibrix; "Flights" for sale. All in good condition.—M. A. S. Berks, South View, Ridgeway, Tonbridge, Kent.

## WANTS

Meccano No. 5 Set. State price.—Fardell, 54, Wardown Crescent, Luton, Beds.

Hornby Dublo Electric Locomotive and Tender; also Rails and Points. Transformer not required.—Blake, Dale House, Carnforth, Lancs. (Tel. 80).

Hornby Dublo Electric Rails and Points.—Drew, 218, Old Bedford Road, Luton.

Two Dublo L.M.S. Coaches, prefer one brake; will part exchange Dublo L.N.E.R. Articulated Unit.—Francis, 129, East Park Road, Leicester.

Geared Roller Bearing—No. 167 and other Gears, all types. Particulars and prices.—J. C. Spence, 3, Outwood Walk, Horsforth, Yorks. Telephone Horsforth 3278.

"Adventures," "Champions," "Hotspurs," "Rovers," "Wizards"; practically complete from January 1945. State price.—Wasdell, 46, Englestede Close, Handsworth Wood, Birmingham 20.

Hornby Electric Engine Gauge 0, any type in good condition.—Woodbridge, The Homestead, Kingsway, Gerrards Cross.

Trix Railway. Single items or Complete Railway; part or whole. State price, etc.—Sturrock, Pilmuir House, Balerno, Midlothian.

Clean "Meccano Magazines," 1940–Feb. 1947.—M. Lustig, 33, Vincent Court, Bell Lane, London N.W.4.

Hornby Dublo Electric Railway; Straight Rails (any quantity); Points; Controls. State price.—F. W. Rawson, 282, Uttoxeter Road, Mickleover, Derby.

Hornby-Dublo Electric Straight Rails, Points, Isolating Rail, etc.—Hockaday, 21, Court Way, Hendon, London N.W.9.

Hornby Locomotives, particularly "Schools" class and 4–4–2T. Details with prices to—A. Weinman, 416, Central Avenue, Rochester 5, New York, U.S.A.

Up to 10/- 100 offered for clean pre-1920 Cigarette Cards.—Cruse, 18, St. Matthews Road Bristol 6.

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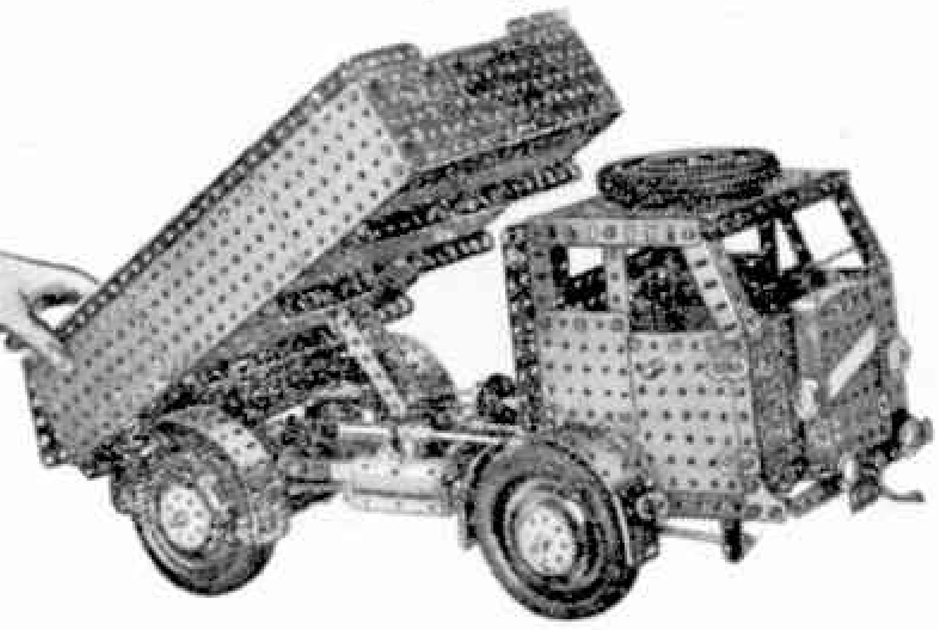

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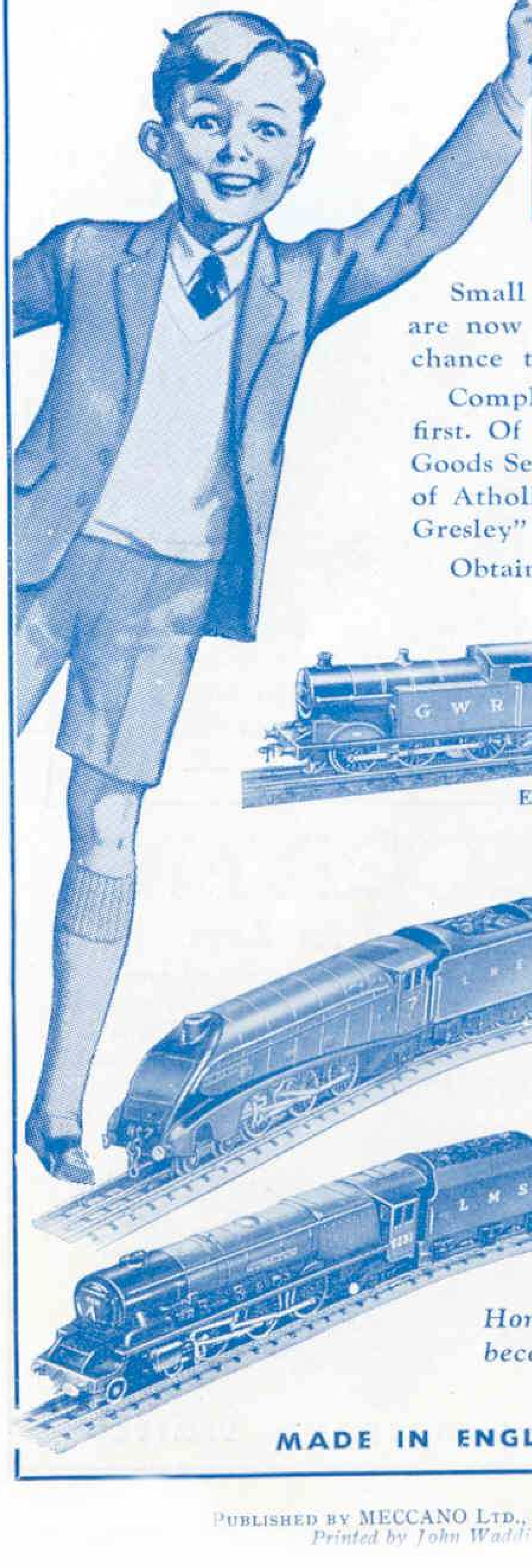

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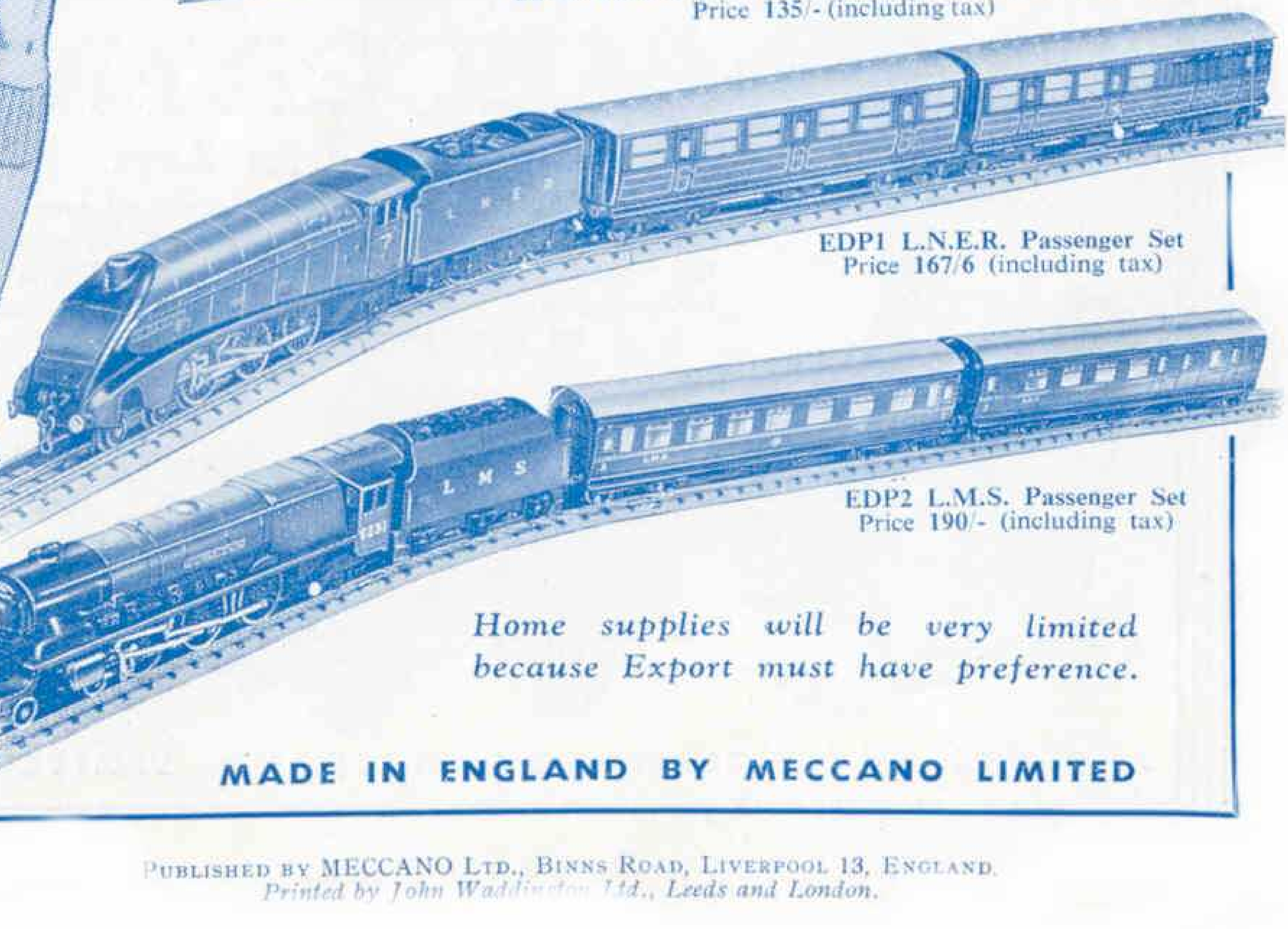


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